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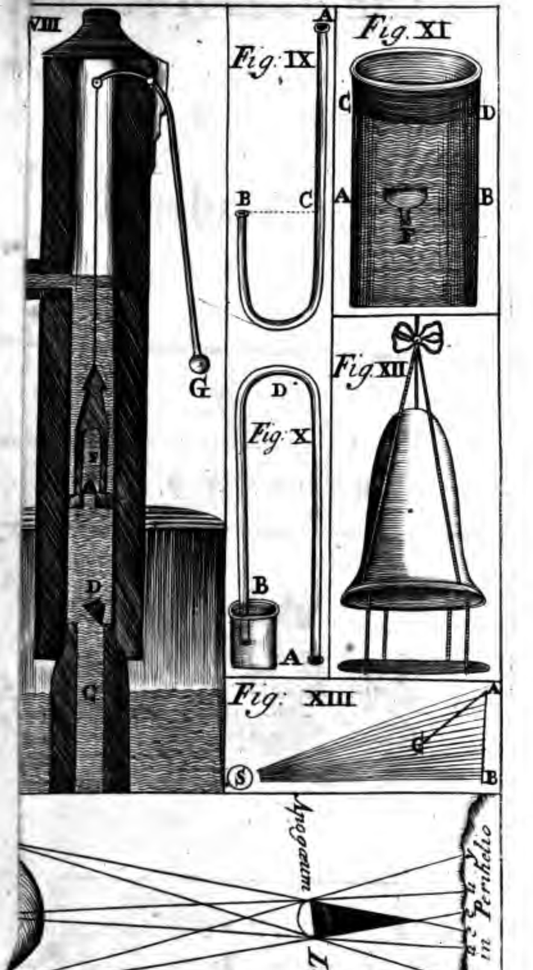
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Fig. XII
Fig. XIII
A
C
S
B
Apogaeum
Luna
Tellus in Perihelio

MISCELLANEA

H. W. James

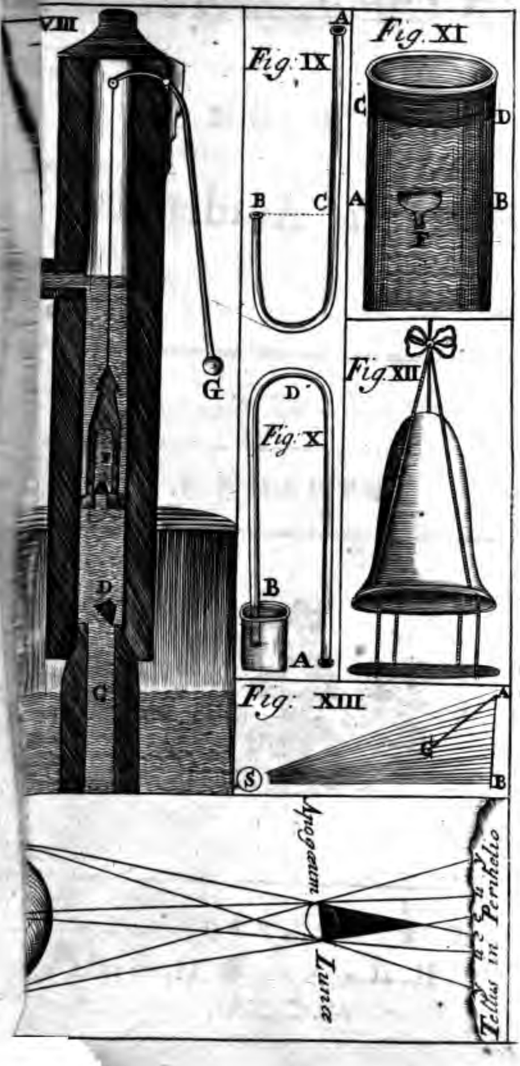
IN USUM

Juventutis Academicæ.

PARS I.

AUTORE J. Jennings.

NORTHAMPTONIÆ:
Typis R. RAIKES & G. DICEY,
MDCCXXI.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The Psalm-Singer's Guide.

1. NOTES have Names given them 1. With reference to their Height of Sound. 2 With reference to their Length of Sound. The first sort of Names are set down in the following *Gamut* Scale.

2. The Scale of the Tenor. The Scale of the *Bass*: Shewing how it corresponds to the Tenor.

The Scale of the Tenor		The Scale of the *Bass*
A in Alt	La	
G in Alt	Sol	
F in Alt	Fa	
E in Alt	La	
D	Sol	
C	Fa	C above
B	*Mi*	B above
A	La	A
G	Sol	G
F	Fa	F
E	La	E
D below	Sol	D
C below	Fa	C
	Mi	B
	La	A double
	Sol	G double
	Fa	F double

3. In this Scale we have two sorts of Names, *viz. Gamut* Names and Singing Names. 1. The *Gamut* Names, A, B, C, *&c.* which are properly the Names of the Lines and Spaces. Now whereas Tunes are prick'd on five Lines, (besides Ledger Lines, *i. e.* short lines above or below, if Occasion be) by this Scale we learn that a Note in the highest Line in the Tenor is in F in alt, and a Note in the highest Line in the Bass is in A; and that it is the same Note for Height with that in the second Space in the Tenor, which is also call'd A.

4. The Singing Names, *Fa*, *Sol*, *La*, &c. which

are properly the Names of the Notes, and ſerv
for both Tenor and Baſs.

5. From *Mi* to *Fa*, and from *La* to *Fa*, you ri
but half a Note; the diſtance of all the others i
a whole Note. But,

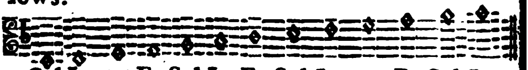
6. A *Flat* (♭) ſet before a Note makes it half
Note lower than its natural pitch; but if it b
before *Fa*, it ſinks it but a quarter of a Note.

7. A *Sharp* (♯) before a Note makes it half
Note higher.

8. A *Flat* or *Sharp* before two or more of th
ſame Notes, that ſucceed without Interruptio
affects them all, except contradicted by anothe
Sharp or *Flat*.

9. The *Tenor* is diſtinguiſhed by this Mark
at the beginning of the five Lines, which is
called the *Tenor Cliff*. The *Baſs* by this Mark
which is called the *Baſs Cliff*.

10. If a *Flat* be ſet on B, immediately after the
Cliff, then the Singing Names are ſhifted, their
Order being ſtill preſerved; *Mi* is found in E, and
the Notes in the ſeveral Places are called as fol-
lows:



Sol La *Mi* Fa Sol La Fa Sol La *Mi* Fa Sol La.

And this *Flat* is no farther to be regarded than
as ſhifting the Notes.

11. The Names given to the Notes with refe-
rence to the Length of Sound are as follow: The
longeſt is a *Breve*, and is as long as two *Semi-
breves*. A *Semibreve* as long as two *Minims*. A
Minim or as long as two *Crotchets*. A *Crot-
chet* is expreſs'd or .

12. Every

12. Every Tune is either in Common Time, *viz.* hen you find this Mark at the Beginning; or in 'riple-Time, and then you have this Mark pre-x'd. Triple-Time differs from Common-Time ı this; that a *Minim* in Common-Time is as long sa *Semibreve* in Triple; and a *Crotchet* in Common s long as a *Minim* in Triple; and so of the rest.

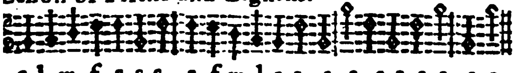
13. When two Notes are ty'd by a Bow over or nder they both belong to one Syllable of the Verse ıat is sung; and in singing Tunes by the singing Names, which is call'd *Solfaing*, when you pro-ıounce such ty'd Notes, you may leave out the Consonant that begins the latter, for better sound-ake; as instead of *Solfa* you may pronounce *So-a.*

14. The Letters *s*, *l*, *m*, *f*, under some of the Tunes, stand for *Sol*, *La*, *Mi*, *Fa*.

15. This Mark signifies that the Tune is not ended, but is continued in the next Line.

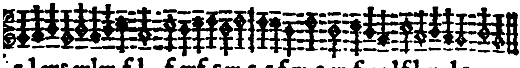
16. So much of a Tune as answers to a Line of Psalm is distinguished by a single Bar in this Collection.

17. To Tune the Voice, first sing up and down the Lesson foregoing in § 10. If you have neither Master nor Musical Instrument, take the Sound of the Notes from a Ring of Bells, calling the big-gest Bell *Fa* (*viz.* the *Fa* above *Mi*) Then get this Lesson of Fifths and Eighths.



s l *m* f s s s. s f *m* l s s s. s s s s s. s s.

Then this Lesson of Thirds.

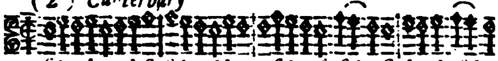


s l *m* s *m* l *m* f l f *m* f s *m* s. s f *m* s *m* f *m* l f l *m* l s *m* s.

(1) *Coleshil* Tenor.

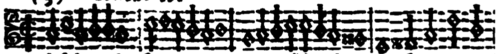
l l s f s l l l. f l s f s f. f l s f s l l l. f s l s f m

(2) *Canterbury*



f l s l t s l f. f l s f l s. s f l s f f l s f. l s l t l s

(3) *Southwel.*

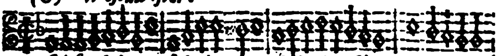


l f l m m l. f s t m l m. s l m f f m l s. l f l s m

(4) *Bristol.*

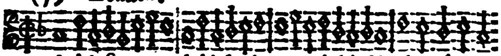
(5) *St. Giles's.*

(6) *Westminster.*



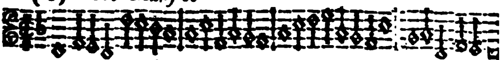
f f f s l f s s. f l s s f s. l f s l s f l s. s t l s s f

(7) *London.*



l l l f s s m s. l l l f s l. s m s l f l f l. l s f s l

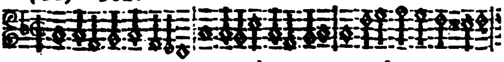
(8) *St. Mary's.*



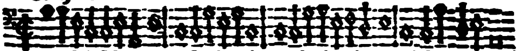
l t m l l s f l. l s f l s f. l s l m l s f s. s l l t m l.

(9) *Glocester.*

(10) 112.

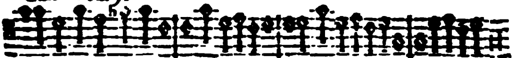


Coleshil Bassus.



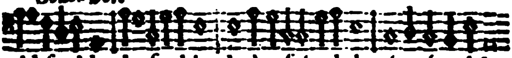
l l l f f l l l. f f s l s f. f f s l l f s l. f f l s l l.

Canterbury.



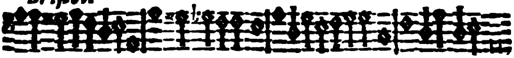
f f s f l m f f. f f s l f s. s s f s l f s t. f s l f s f.

Southwel.

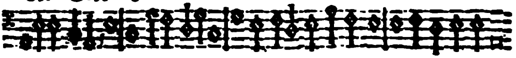


l l f s l l. l s f s l l. l l s f f s l l. f s f m l l.

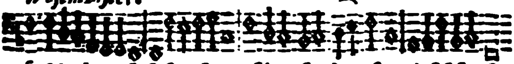
Bristol.



St. Giles's.

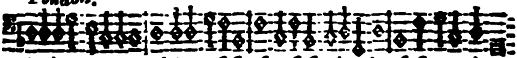


Westminster.



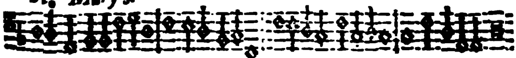
f f l s l s s f. f f m f s s. f l s f s l m f s. l f f f s f.

London.



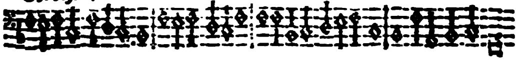
l l l s m s s s. l l l s f f. f s f f s l s l. f f s s l s.

St. Mary's.

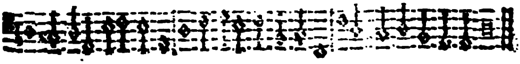


l l l f f f s l. f m l f s f. f m l s f s l s. s f l l l l.

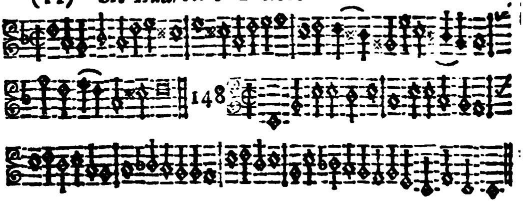
Glocester.



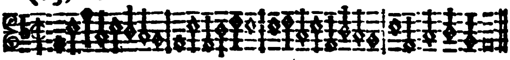
112.



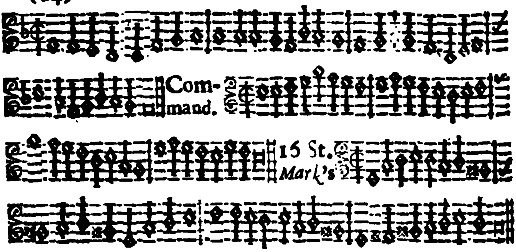
(11) *St. Andrew's* Tenor.



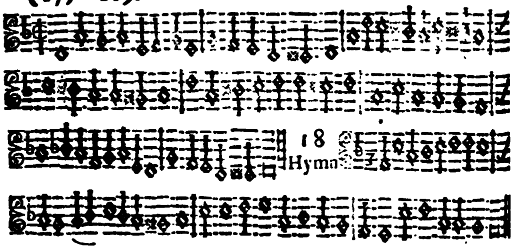
(13) *St. David's.*



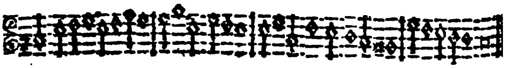
(14) 100.

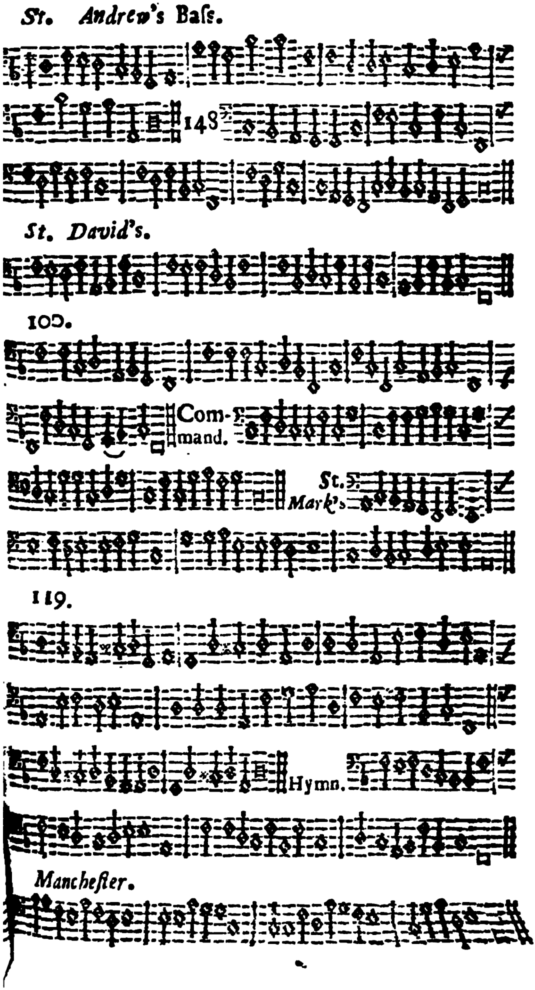


(17) 119.

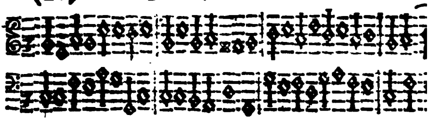


(19) *Manchester.*



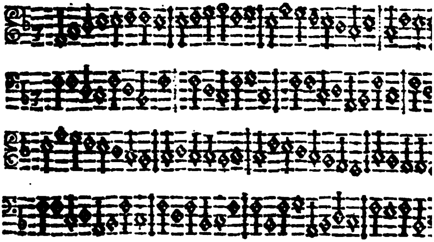

St. Andrew's Bass.
148
St. David's.
100.
Com-mand.
St. Mark's
119.
Hymn.
Manchester.

(20) *St. Anne's.*

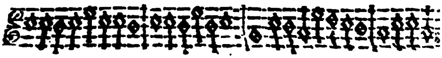


(21) *St. Luke's.*

(22) 81.



Coleshil Medius



y Medius.
M.
l.
'r M.
s M.
M.
Hymn
T. M.
119
M.

25. Any Tune may be prick'd in the
veral *Modes*, and still be the same Tune,
the same Singing Names. To place a
any *Mode* requir'd, you must place it s
Staff, as that *Mi* may stand in the Plac
to that *Mode*; then put the *Flats* or *Shar*
beginning, which belong to that *Mode.*

26. Take for Example the first Lin
100 Psalm Tune, *Tenor* and *Bass*, in s
Modes (the seventh being found before
the Tunes) in all which it is *Solfa'd* by
Names.

Tenor. *Bass.*

27. One *Mode* would not be suffic
prick all Tunes conveniently (any mo
one *Cliff*) for then in some Tunes, on
Parts at least would want two or more
Lines, which would puzzle the Learn
hinder the close Printing of Tunes.

No. II.

ORATORY.

CHAP. I.

Of the Nature and End of Oratory.

§ 1

ORATORY is the Art of chusing, ranging and expressing our Thoughts, so as to move the Passions of others toward some End proposed.

§ 2

The chief Part of the *Orator* is to speak as one that feels the Passion he would excite in others: The Orator most effectually moves when he is really moved; provided he behaves decently and properly in such Emotion: And it's worth while for the Orator, who is unconcerned in the Passion he would excite, to work his Soul as much as possible into it; at least he must endeavour to imagine the genuine Produce and Language of the Passion he would appear to feel; and then he is said to follow Nature.

Tatler Vol. *II*, No. 68.

§ 3

Yet this *Art* ſhould be concealed by a ſtudied Neglect, that it may paſs for Nature; and the Orator ordinarily ſhould appear to have no Deſign upon the Auditory or Opinion of his own Power to charm; but ſeem only to give free Vent to his own Paſſion; (in the warmer Parts of his Diſcourſe) that the Hearers may think they move of their own accord, whilſt really they are led by the Orator.

§ 4

The Orator muſt not haſtily conclude he has wrought up his Hearers to the Paſſion deſigned becauſe he has gain'd their *Applauſe*.

§ 5

In Oratory are to be conſidered I. The Choice of Thoughts to be delivered. II. The Diſpoſition of them. III. The Style or Dreſs. IV. The Pronunciation. V. The Action.

CHAP. II.

Of the Choice of Thoughts.

§ 6

AN Orator ſhould carefully ſtudy the Heart of Man and lay Men open to themſelves; repreſenting naturally their Paſſions, perverſe Judgments, Shifts, Weakneſſes, &c. taking care not to irritate nor to point at particular Perſons; which Caution is moſt neceſſary in publick Reproof; according to that — *parcere Perſonis, dicere de Vitiis.* §7

§ 7

A *Passion* is extinguished by playing another Passion against it; as *Anger* is weaken'd by *Pity*, damped by *Reverence* or quenched by *Love*; and frequently we find Passions of most Sorts weaken'd, if not wholly dissipated by a Burst of *Laughter*. Or else a Passion is extinguished by raising a stronger of the same Sort fixed on another Object, as a nobler Love swallows up a meaner. Nay sometimes a Passion if very strong is to be play'd with, like a Fish upon the Hook; as *Demosthenes*, when he would divert his *Athenians* from an Enterprize they were eager upon, falls in with them, perswades them to it, but then suggests artificially such Difficulties and Dangers as tir'd out their Zeal, and effectually discouraged them.

§ 8

Let the Discourse be suited to the Capacity Manners Inclinations Humours and Interests of the Hearers: Regard is also to be had to Time and Place; yea to the Orator's own Station Age Rank and Condition.

§ 9

Enlargement is needful upon account of the Dulness and Slowness of the Mind, which requires Time and repeated Impressions to apprehend or be moved. The Orator enlarges by particularising, by Instances, by Synonimous Phrases, by turning a Thought various Ways and giving it in different Views, or by the Ad-

juncts

juncts of the Subject, of which this Line suggests Hints

Quis? Quid? Ubi? Quibus Auxiliis? Cur? Quomodo? Quando?
See *Caussin* de Eloquentia Lib. VII Cap. 12.

With the *Polite* the Orator should preserve a saving Sobriety of Speech, but more Enlargement is requisite with the *Vulgar*; neither must they be overcharged with too much Matter at once lest all be lost: Dry Reasoning especially should be spun out with many Words: And in stating Facts to them be very circumstantial, by which you'll not only be more easily understood but also more readily believed.

¶ 2

CAP. III.

Of the Disposition of Thoughts.

§ 10

AN *Exordium* may be ——

1. From the Adjuncts of the Subject, which is like beating round the Bush.

2. A simple plain Declaration of the Business and Design of the Discourse.

3. By falling upon the principal Topick, which is the Hinge on which the Question turns.

4. By Stories, Fables, Adagies, or other Conceits.

5. By Invocation of Assistance; as the *Poets often do*; altho' the Romish Preachers put *their Ave Mary* after their Exordium, and so

do

veral Poets, as *Milton*, *Virgil* and *Ovid*. Abrupt; and so Romances begin and *Tul*- rst Oration against *Catiline*.

Exordium should be proper, and not like Prologue equally suit many Subjects: It l be contrived to procure the Attention avour of the Audience, or to be a Key e Discourse. See *Causin* de Eloquentia VI. Cap. 7. at the End.

§ 11

branching out a Discourse the common butions are generally the best, as being natural, or however received as such.

§ 12

e Orator should ordinarily first convince *udgment*, that he may afterwards more sfully (not to say more honestly) raise assions, taking Care the while to keep e Hearer's Attention rather by Conceits miles than warm Expressions. But if the r has strong Prejudices and Passions t, these must be removed before his Rea- will be heard. See *Cicero*'s Oration *pro ia*.

§ 13

good *Arguments* first, lest the Hearers judiced against the following ones: Re- the very best unto the last; because the entioned, *cæteris paribus*, dwell most on ind. Place grating and unpleasant Things crabbed Objections in the middle in

good

goodCompany; that the Offence may be obvia-ted and the Diſguſt taken off. So *Ulyſſes* diſ-poſes the peeviſh Buſineſs of *Palymede*; reſer-ving the Affair of the *Palladium* to the laſt. See *Ovid*'s Metam. Lib. 13.

§ 14

In addreſſing the *Paſſions* let the cooleſt and moſt obvious Things be placed firſt; that by Degrees the Orator may raiſe that Paſſion which he could not raiſe without ſuch Grada-tion; and alſo that the Orator may ſeem to ſpeak extempore out of the Fulneſs of his Heart and without Deſign; (§ 13) for thus his bolder Strokes will ſeem no other than the true and genuine Language of his Paſſion gra-dually wound up to the Heighth: For which Reaſon alſo, in proceeding from Paſſion to Paſſion, it ſhould be done with proper Tranſi-tions and not abruptly: See *Dryden*'s Ode on St. Cæcilia's Day in his Miſcellanies or in *Biſs*: [redacted]

§ 15

Conclude a Diſcourſe with ſome pithy or af-fecting Sentence: And it may not be amiſs if it contain ſome principal Thought of the Diſ-courſe: However let it be ſomething taking, that the Hearer may regret that your Diſcourſe is come to an End.

§ 16

In *Converſation* let others ſeem to lead the Diſcourſe, yet endeavour unperceived to direct it:

t: And fail not to give others Opportunity to hine. Save your beſt Thoughts till the Company is moſt at leiſure to hear them, and till he Rubbiſh of the Subject is cleared away, and noiſy People are out of Breath; that you may *not be interrupted or neglected.*

CHAP. IV.

3 ¶

Of Style.

§ 17

IT is the Fault of ſome little Genius's to take too ſcrupulous Care in labouring more than they need to finiſh ſome particular Piece of a Work, of which they are more enamoured, than others: Rather ſhould the Orator endeavour to carry on a juſt and regular Deſign and make his Compoſure uniformly laboured and correct.

§ 18

Concerning Style we ſhall conſider I. The Kinds of Style, II. The Goodneſs of Style, III. The Peculiarity of Style whereby one Author is diſtinguiſhed from another.

The moſt remarkable Sorts of Style are the Plain, the Familiar, the Figurative and the Grave.

§ 19

The *Plain Style* endeavours only to expreſs the Thoughts rightly and intelligibly. See an Inſtance *Geneſis* Ch. XLIV. v. 18. — 34.

§ 20

§ 20

The *Familiar* is such as we use in free Conversation: It is the Style of *Comedy*. See *Swift*'s Harris's Petition in his Miscellanies.

§ 21

The *Figurative* embellishes a Thought with the Tropes and Figures of *Rhetorick*. The principal Tropes and Figures to be most endeavoured at are these, *Metaphors*, *Ironies*, *Hyperboles*, *Climaxes*, *Images and Descriptions*, *Interrogations*, *Apostrophes*, *Prosopopœias and Diologisms*: I do not mention *Turns*, because though many of them are beautiful when they come naturally without seeking, yet when they are sought for, they are generally stiff and disagreeable; and when they are the best will but ill suit solemn and pathetick Discourses. See Instances of all in the common Systems of *Rhetorick*, and particularly of good Turns in *Causin* de Eloq. II. 15. at Begin.

§ 22

Seeing Things more forcibly strike the Mind by their own immediate Presence than by Representation of them, Figures should not be used but where they are stronger larger or brighter than the Things themselves; except the Thing cannot be apprehended otherwise than figuratively.

§ 23

The Figurative Style is divided into the Merry, the Easy and the Warm.

§ 24

§ 24

The *Merry* is design'd to move Laughter; and when it debases a Subject for this End 'tis call'd *Burlesque*. Such is the Vein of *Hudibras*.

§ 25

The *Easy* aims gently to move: Such are the fine Descriptions of *Telemachus*, and that Pastoral in *Spectator*. VIII. N° 603.

4 ¶

§ 26

The *Warm* wakes the Soul in strong Emotion. The principal Species of it is the *Sublime*; such as *Milton* is happy in, and *David* in many Psalms, particularly the XVIII and CIV. See also *Watts's* Horæ Lyr. Book I. The Poem call'd *The Creator and the Creatures* and his Hymns II. 26. The Sublime is sometimes humorously accommodated to mean Subjects, and becomes merry; as in the *Splendid Shilling*, *Cyder*, and the like. The Warm Style is accommodated to most Passions; as to *Rage*, *Grief* &c. See *Biss* under the Names of the several Passions.

To see how far the Warm differs from the Plain, undress it of all its Figures and Tropes.

§ 27

The *Grave* Style is betwixt the Plain and Figurative: The Ground is plain, on which are bestowed a very few easy Figures: It has longer and fuller Periods than the Plain, which are connected by Particles that run one Sentence into another; such as *thus*, *for*, *but*, *this*, *where-*

fore, notwithſtanding &c. See the Dedication before *Lock*'s Eſſay. 'Tis ſometimes humorouſly accommodated to little Subjects; as in *Voiture*'s Letter of the Lyons and of the Particle *Car*.

§ 28

In *Epiſtles* almoſt all Sorts of Styles may ſometimes be uſed; but what we call the Epiſtolary Style is a Mixture of the Plain and Familiar. See *Tatler* II. Nº 87.

§ 29

The Orator muſt ſuit his Style to his Subject, Auditory, and Deſign, in the ſame manner as his Thoughts. § 8.

§ 30

The Goodneſs of Style conſiſts in Purity Perſpicuity, Elegance and Cadence.

¶ 5

§ 31

Purity conſiſts in uſing ſuch Words and Phraſes as are in Faſhion amongſt polite Perſons of that Age and Language we write in. It forbids

1. Obſolete and vulgar Words, as alſo needleſsly introducing exotick Words. See *Spectat.* II Nº 165.

2. Words borrowed from the learned Languages: And the Style ſo vitiated is called *Pedantick* or *Bombaſt*; ſuch are theſe Lines in Dr. *Wild*'s Benefice.

'Fortune hath not beatified me with any
'*mundane* Promotions, neither have I conglo-
'*merated* any *terreſtrial* Subſtance, but if with

ye

'your perſpicuous Luminaries you contem-
'plate and perſcrutate theſe Teſtifications
'you ſhall be animadverted &c.

3. That Clipping of Words uſual in the Style of the Smart Fellows. See *Tatler* IV. N° 230.

Yet are great Wits allowed to ſupport the Majeſty of Verſe by reviving old Words or coining new ones borrow'd from other Languages, when they are more expreſſive of the Idea. So *Milton* uſes *Welkin*, *Lore*, *Wight*, and many more borrow'd from *Spencer*. So *Dryden* borrows *falſify'd* from the *Italian* to ſignify *not to be of Proof*. - - - 'His Shield
'Is falſify'd, and round with Javelins fill'd.

This Liberty is odious in Proſe, and worſe ſtill in Converſation.

§ 32

Perſpicuity conſiſts in expreſſing a Thought clearly, without a needleſs Multiplicity of Words. To Perſpicuity is oppoſed——

1. An obſcure and intricate Style. See *Spect.* VII. N° 516. pag. 162, 164. Vol. VIII. N° 617. pag. 228.

2. A fluctuating, enervate and diſſolute Style, where the Periods are ill conducted as to Order of Parts, and no Care is taken of connective Particles. See *Cauſin* de Eloq. Lib. II. C. 12.

3. Verboſity. See *Guardian* Vol. I. N° 25. p. 101.

§ 33

To attain Perſpicuity, compoſe ſomewhat and lay it by till it is forgot, and then examine it

it as the Work of another; thus you will di cover Faults that escaped you in the Heat Writing, through fatherly Affection to t Products of your own Brain.

¶ 6.

§ 34

Elegance consists in a *curiosa Fœlicitas* in sing Tropes and Figures. Here good Exampl are better than Rules; and the ordinary S stems of *Rhetorick* do but little good; nay form a Style by them makes it stiff, and spo that genteel easy Freedom of Expression whi is essential to an elegant Style. To affect it t much is the Way to miss it, as in courting a c Mistress. See a good Instance of this Elegan in the Description of *Calypso's* Grotto, *Telem chus*, page 4, 5.

§ 35

'Tis no Elegance ——

1. To daub a Subject with Figures which quires the plain and familiar Style: As in a rious professed Sublimity on low Subjec where pompous Sound is expressive of lo Thought. See *Spectator* VIII. N° 617. p. 2 Herein most *Romances* are faulty. See *Causin* Eloquen. Lib. II. Cap. 8. Figures are also i pertinent in strict Science, or in the Langua of Distress; where the Figurative Style, n even the Grave is absurd. See *Judah's* Spee *Tatler* IV. N° 233.

No wonder then those, who perpetually ai

at moving Strains throughout a Discourse, a good Part whereof will not admit them, never move at all: For their false Fire palls the Taste of the Auditors, yea perhaps nauseates, and spoils the Effect of that which is proper.

2. To overcharge a Subject with Rhetorical Embellishments, either as to Number or Boldness of the Figures. Here *Cowley* must be blamed as overgrown rich in Figures. Here also we must tax fulsome Dedications. See *Guardian* I. N° 4. and *Causin* de Eloquen. Lib. II. Cap. X. p. 75. Col. 2.

As likewise honest *Sancho*'s Fault of stringing Proverbs. See *Causin* de Eloq. Lib. II. Cap. X. p. 76. Dr. *Swift*'s Tritical Essay, in his Miscellanies.

And lastly a professed and insipid Vivacity of Style, when it wants the Support of sprightly Thoughts; which is usual with the smart Fellows. See *Spect.* VI. N° 403. p. 31. Vol. VIII. N° *616.*

7 ¶

§ 36

We offend as to Elegance ——

1. When the Figures are frigid and paultry. See *Guardian* I. N° 25. p. 101.

2. When they are shocking, uncouth, inconsistent, incredible or unnatural. See *Spect.* V. N° 356, p. 149. Vol. VIII. N° 595.

3. When we allegorise and perpetuate a Metaphor or *Simile* where the Foundation of it is

not

not perpetual. See *Caussin* de Eloq. Lib. II. (
IX. p. 73.

4. When the Style is insipidly easy. *Tatler* Vol. III. No 163.

5. Worst of all when we wound Religio Modesty, which is the greatest Inelegance nauseates Men of the best Taste. See an Inst of this *Hellish Style*, *Tatler* III. No 137. p. 1

§ 37

Poetry is expected to be elegant; yet Dr. S has given us some Specimens of Poetry en taining enough without any Tropes or Fig at all. See *Tatler* I. N° 9. and Vol. IV. N° :

§ 38

Cadence consists in disposing the Word such Order and with such Variation of the riods, as may when read strike the Ear wi sort of musical Delight; and in avoiding Words as would spoil the Musick. The Pe ction of it is to have the Sound, as Mr. *Pope* presses it, an Eccho to the Sense. See *Pope*'s say on Criticism, or *Spectator* Vol. IV. N° 2 Cadence in Poetry is called *Number*.

To attain good Cadence of Style, tune Ear by reading some harmonious Style; as *lemachus*, *Austen*'s Devotions, and the *Eng reading Psalms* of the last Translation; wh you may compare with the old Translation the *Common Prayer*, at Psſ. II. 1. 12 and XCIX. 1. to see the Difference betwixt g and bad Cadence.

¶ 8

§ 39

The *Peculiarity* of a Man's Style is a Mark by which he is known, as by his Face, Voice, or Hand-writing. As Painters from many scattered Beauties collect one perfect Idea, so (inasmuch as all Beauties are not to be found in the Style of any one Author) we must collect from many; and yet not servilely ape any Man, but follow Nature: For Instance if Genius incline to the soft Style, we should not affect the nervous and masculine.

To know the Bent of our Genius, we should mind what Sort of Beauties in our Composures please us most; and especially in what we have best succeeded with our Auditors; yet sometimes the Infirmities of the Voice forbid us to aim at some Beauties of Style, in a Piece to be delivered, which we might well enough attain in the Composure.

§ 40

'*Sir William Temple*'s Style is very harmo-
'nious, sweet, full of Spirit and Raciness of
'Wit, his Similes fine, his Allusions graceful,
'his Words significant and just; the whole
'has a Charm, which amuses the Reader with
'a serious Pleasure, puts him in a good Humor
'whilst he is reading, and leaves him thought-
'ful when he leaves off.' See his *Essay on the Excesses of Grief*. Miscell. Part I.

§ 41

§ 41

'*L'Estrange*'s Talent is Humor, in which his 'Vein flows very freely: He is Master of the 'English Idioms and Proverbs; tho' he seem 'sometimes to use them with Affectation, and 'to be too fond of them. His Style is pleasant, 'smooth and natural; and that Gayety and 'seeming Negligence which is peculiar to him 'entertains you with a Sort of familiar De'light, like a fine Droll.' See his *Fables*.

'These two differ much as *Cicero* and *Te'rence*: In *Temple* you find more of the Ora'tor, in *L'Estrange* more of the Englishman.

§ 42

'*Dr. Sprat* is a most exact and genteel Wri'ter: His Style is grave and manly, infinitely 'to be preferred to *Sir Roger*'s, and having all 'that is beautiful in *Sir William*'s, only if pos'sible with more Correctness and Decency. 'There appear in him all the Sweetness and 'Fluency, handsome Turns and fit Expressions 'than can be desired; the most charming Ele'gance and strictest Propriety. He is witty 'without Shadow of Affectation: His Cadence 'like a pleasant Stream makes a little Noise, 'yet affects with a calm Delight, which if it 'were louder would be lost.' See his *History of the Royal Society*, p. 33.

¶

§ 43

I might observe in *Dr*. Tillotson's Style, that

Easine

asiness and beautiful Simplicity in all his Expressions, which one that reads him is apt to think may easily be imitated, and yet perhaps nothing so hard. —— ' ut sibi quivis Speret idem sudet multum frustraq; laboret. See *Tillotson* Vol. I. Fol. Ser. 42. p. 495.

So true is what *Mr. Le Clerc* says, that it is easier to imitate the lofty Flights of *Seneca* or *Lucan*, than the Simplicity of *Terence*. *Felton* of the Classicks, p. 209.

§ 44

The Style of *MOSES* charms us with a simple Grandeur.

The Psalms of *DAVID* please us with an easy Sweetness.

The Writings of *SOLOMON* entertain us with a sententious Weight, full of Spirit.

ISAIAH ravishes with extatick Loftiness.

We admire *DANIEL's* Princely Decorum.

We praise St. *LUKE's* Perspicuity, Propriety and Harmony.

PAUL strikes us with Strength and Energy.

§ 45

The Character of the Style of several Ancient Authors see in *Causin* de Eloq. Lib. III. Cap. 4. amongst whom *Cicero's* Style seems the best to be used to a polite Auditory; but with the Vulgar 'tis better to use a rougher Assurance and Pathos, and fright them in *Demosthenes's* Way, who is the Pattern of those who speak to the *Vulgar*.

See *Demosthenes* and *Cicero* compared, as their different Way of expressing the sa[me] Thought, in *Causin* de Eloq. Lib. III. Cap.

§ 46

Yea there is a Style peculiar to the seve[ral] Ages of Man's Life, as those skill'd in *Physi[og]nomy* will easily imagine.

Causin de Eloq. Lib. II. C. 11. p. 113.

¶ 10

CHAP. V.

Of Pronunciation.

§ 47

WHEN we speak in publick we sho[uld] speak as we would do in Conversati[on] with such Persons, of these Subjects; o[nly] speaking stronger that all may hear. Nei[ther] should we spend our Voice in waste and b[awl] as if the Auditory were deaf; or treat weig[hty] and warmer Matters in the careless Tone [of] Conversation upon ordinary Subjects. Th[ose] who by too much Heat disorder their Pron[un]ciation should check their Fire.

§ 48

The Excellence of a Voice consists in bei[ng]

1. Strong, clear, and manly.

2. Distinct and articulate, that the wh[ole] Sound may be heard.

3. Grateful and musical.

4. Manageable, so as to be suited to all Va[ri]ety of Matter; especially as to Emphasis and [Ca]dence of which we shall now treat.

§ 49

Emphasis is the pronouncing a Word or Words with greater Strength and Acuteneſs; and it points out to us what is moſt conſiderable and bears the greateſt Streſs in a Diſcourſe. Every Sentence generally has ſome Part or Parts more emphatical; yea every Comma, or leaſt Part of a Sentence, has ſome more emphatical Word or Words.

§ 50

Of Emphaſes there are infinite *Degrees:* Greater Paſſions require ſtronger Emphaſes: In the ſame Sentence ſome Emphaſes are much ſtronger than others, as the Words bear greater or leſs Streſs. Again there is as great Variety in the *Frequency* of Emphaſes: The rough turbulent Paſſions give frequent Emphaſes; and at *Billingſgate* every Word is emphatical: more particularly the Language of—

'*Anger* is an acute, raiſed, and hurrying Sound.

'*Sorrow* flexible, low and interrupted.

'*Fear* low, hæſitating, and abject.

'*Courage* loud and clear.

'*Pleaſure* luxurious, mild and tender.

'*Perplexity* grave, uniform and earneſt. See *Spectator* Vol. VIII N° 541.

§ 51

We offend as to Emphaſis—

1. When we uſe none, but ſpeak in a cold careleſs manner.

2. By

2. By unnatural Excess of it.

3. By wrong placing it; as also when we enter so far into a Passion, as to lose the Command of our selves, and are not able to change our Pronunciation as the Passion in the Composure changes. See *Spectator* Vol. VI. N° 290. p. 150 ¶ 11

§ 52

When we use an uniform Way of placing the Emphasis, without regard to the Thought it is called a *Canting Tone*; not unlike a Kind of Singing all in one Tune; which now and then happens to be right, but commonly wrong.

Some have a womanish squeaking Tone.

Some have a childish howling Tone.

Some a Romantick or Poetical Tone.

Some put the Emphasis always at the *Beginning* of a Sentence, some at the middle, some at the End.

Some give every three or four Words an equal Emphasis.

This Canting may please some *ancient Females*, but certainly nauseates all of good Taste

§ 53

Cadence in Pronunciation is the Falling of the Voice at the Conclusion of every Division of the Discourse, the better to distinguish them; and it is signify'd by the Points , ; : which signify four Degrees of Cadence, *shewing when* we are to fall one, two, three, or four *Notes*: Yet greater Falls are not made at once

but gradually. At the End of a Paragraph we make a deeper Cadence than at an ordinary Period. A *Parenthesis* is but a continual Cadence.

Hence Cadence of Style § 38. is that which renders the Sentence, when pronounced with its just Emphases and Cadences, pleasant and musical.

§ 54

We offend as to Cadence——

1. When we neglect it, and speak in a School-Boy's Tone, which regards neither Cadence nor Emphasis.

2. When we make it unjustly.

3. When we give the Voice greater Velocity in it than elsewhere.

§ 55

In Prosopopœias, Dialogisms, Antitheses, Objections and Replies, let the Voice distinguish the Persons and Parts; and in Repetitions let the Voice be loudest the second Time. Begin a Period lower than the last ended; and speak loud in Apostrophes to inanimate Things. Save the Voice before a strong Pronunciation; and therefore in a Climax, where the Voice should rise gradually, look to the End of it before you begin it.

§ 56

The Points in § 53 may be considered as signifying four Degrees of *Pause*. We should take Breath at the biggest Pauses possible; nay at Periods only, if we can so long hold out: To which Purpose an Exercise of reading long Sentences may be useful.

§ 57

Poetry is not to be read otherways than if it was Prose; and if such reading spoils the Numbers, it is the Author's Fault, not the Reader's; and to help out hobling Metre by a chiming way of reading is to commit a Fault our selves to hide the Author's.

§ 58

Demosthenes they tell us cured the Grossness of his Voice by wearing Stones in his Mouth; helped the Shortness of his Breath by repeating Verses as he ran *up a Hill; and* conquered the Noise of Assemblies by *speaking to the* Waves.

CHAP.

¶ 12

CHAP. VI.

Of Action.

§ 59

ACTION is the Motion of the several Parts of the Body accompanying Speech, the better to signify what we would express. Here we offend——

1. When warm Thoughts are delivered without Action and we speak like Images.

2. When our Action is too soft and foppish.

3. When it is too vehement and shocking.

4. When we preserve an uniform Action through all the Parts of a various Composure.

5. When Action is over-abundant; for Instance, if we act all we say, as if, upon mentioning *the Pulse*, I should actually feel my Pulse.

We should be modest and sparing of Emphasis and Action in the Beginning of a Discourse, and should rise gradually upon the Auditory; and the Composure should be accordingly contrived for it. § 14.

§ 90

As different Passions require different Action, so the *Genius* and *Temper* of a People strangely varies natural Action: What is natural in *France* is not in *England*, much less in *Spain*. Yet we might give some Rules that will hold for all Passions and all Countries: Namely To cast the Eyes on the several Parts of the Auditory by Turns—— Not to raise the Hands above the Eyes—— Not to use the left Hand alone— In *Egotisms* to lay the right Hand on the Breast— But I'll desist and leave the rest of these Precepts regarding particular Passions to Nature; lest many Rules should render the Action stiff and mechanical.

Rapin of Eloquence: In his Critical Works.
Rules for Speaking and Action.
Betterton's Life.
Tatler. Vol. II. N° 70.

N° III.

EUCLIDIS

Libri Secundi *Prop.* I.-----X.

Algebraice demonstratæ.

Pone $z = a + e$.

Prop. I.

Eadem est ac Arithmeticæ nostræ *Prop.* 11.

Prop. II.

$zz = za + ze$, per Arithm. *Pr.* 44. *Cor.* 2.

Prop. III.

$ze = ae + ee$, per Arithm. *Pr.* 44. *Cor.* 2.

Prop. IV.

$zz = aa + 2ae + ee$, per Arithm. *Pr.* 44. *Cor.* 3.

Prop. III.

Eadem est ac Arithmeticæ *Def.* 54. *Cor.* 3.

Prop. IV.

Si $m : n :: o : p$
& $e : f :: m : o$
& $g : h :: n : p$ Tum $e : g :: f : h$.

Demonstratio.

1. $m : o :: n : p$, per Arith. *Pr.* 40.
1|2 $e : f :: g : h$, per *Euc. Ax.* 1.
2|3 $e : g :: f : h$, per Arith. *Pr.* 40.

Conversa Propositionis IV.

Si $e : f :: m : o$
& $g : h :: n : p$
& $e : g :: f : h$ Tum $n : m :: p : o$.

Demonstratio.

1. $e : f :: g : h$, per Arith. *Pr.* 40.
1|2 $m : o :: n : p$, per *Euc. Ax.* 1.
2|3 $n : m :: p : o$, per Arith. *Pr.* 40.

Prop. V.

Si $m : n :: o : p$ tum
$m - o : n - p :: m : n$.

Dem

Demonstratio.

$= no$, per Arith. *Def.* 54. *Cor.* 2.

$- mp = mn - no$, per *Euc. Ax.* 3.

$o : n - p :: m : n$, per Arith. *Pr.* 40.

Prop. VI.

$n : n :: o : p$ & $r : s :: o : p$ tum

$: n - s :: o : p$.

Demonstratio.

$= mp$ & $so = rp$, per Arit. *Def.* 54. *Cor.* 2.

$- so = mp - rp$, per *Eucl. Ax.* 3.

$- r : n - s :: o : p$, per Arith. *Pr.* 40.

Prop. VII.

$a = b$ & $c = d$, tum $a : c :: b : d$, quia

ad, per Arith. *Pr.* 44. *Cor.* 2.

Prop. VIII.

$a \sqsubset b$ tum $\frac{d}{a} \sqsupset \frac{d}{b}$, per Arith. *Def.* 40.

Prop. IX.

$a : c :: b : c$ tum $a = b$. Nam $bc = ac$; $a = b$, per Arith. *Pr.* 44. *Cor.* 2.

Prop. X.

$\frac{c}{a} \sqsupset \frac{c}{b}$ tum $a \sqsubset b$, per Arit. Def. 40. Cor. 1.

Prop. XI

Prop. XI.

Si $a:b::e:f$ & $c:d::e:f$ tum $a:b::c:d$, per *Euc. Ax.* 1. Rursus si $a:b::c:d$ & $e:f::g:h$ & $c:d::g:h$ tum $a:b::e:f$, per *Eucl. Ax.* 1.

Prop. XII.

Eadem est ac Arithmeticæ *Prop.* 41.

Prop. XIII.

Si $\frac{b}{a} = \frac{d}{c}$ & $\frac{d}{c} \sqsubset \frac{f}{e}$ tum $\frac{b}{a} \sqsubset \frac{f}{e}$, per Arith. *Prop.* 44. *Dem. gr.* 1.

Schol.

Si $\frac{b}{a} \sqsupset \frac{d}{c}$ & $\frac{d}{c} \sqsupset \frac{f}{e}$ tum $\frac{b}{a} \sqsupset \frac{f}{e}$.

Prop. XIV.

Si $a:b::c:d$ & $a \sqsubset c$ tum $b \sqsubset d$, nam $\frac{b}{a} = \frac{d}{c}$; ergo $b \sqsubset d$, per Arit. *Def.* 40. *Cor.* 3.

Schol.

Si $\frac{b}{a} \sqsubset \frac{d}{c}$ & $a \sqsubset c$, tum $b \sqsubset d$, nam si $b = d$ tum (per Arith. *Def.* 40. *Cor.* 2.) $\frac{b}{a} \sqsupset \frac{d}{c}$ contra Hyp.

Prop. XV.

$a:b::xa:xb$. nam $\frac{xb}{xa} = \frac{b}{a}$, per Arith. *Prop.* 20. *Cas.* 3.

Prop.

Prop. XVI.

Si $a:b::c:d$ tum $a:c::b:d$, per Arith. 40.

Prop. XVII.

Si $a:b::c:d$ tum $a-b:b::c-d:d$.

Demonstratio.

$bc=ad$.

$bc-bd=ad-bd$, per *Euc. Ax.* 3.

$a-b:b::c-d:d$, per Arith. *Pr.* 40.

Prop. XVIII.

Si $a:b::c:d$ tum $a+b:b::c+d:d$,
i ratione.

Prop. XIX.

Si $a:b::c:d$, tum $a-c:b-d::a:b$;
ia (per *Eucl. Ax.* 3.) $ab-cb=ab-ad$.

Prop. XX.

Si $a:b::d:e$ & $b:c::e:f$ &

$= c$ tum $d=f$:
el vel

Demonstratio.

$a:c::d:f$, per Arith. *Def.* 54. *Cor.* 3.

$a:d::c:f$, (Arith. *Pr.* 40.) *i. e.* $\frac{d}{a}=\frac{f}{c}$.

Valet *Prop.* per Arith. Def. 40. Cor. 3.

Pr

Prop. XI.

Si $a:b::e:f$ & $c:d::e:f$ tum $a:b::c:d$, per *Euc. Ax.* 1. Rur $a:b::c:d$ & $e:f::g:h$ & $c:d::$ tum $a:b::e:f$, per *Eucl. Ax.* 1.

Prop. XII.

Eadem est ac Arithmeticæ *Prop.* 41.

Prop. XIII.

Si $\frac{b}{a}=\frac{d}{c}$ & $\frac{d}{c}\sqsubset\frac{f}{e}$ tum $\frac{b}{a}\sqsubset\frac{f}{e}$, per A *Prop.* 44. *Dem. gr.* 1.

Schol.

Si $\frac{b}{a}\sqsupset\frac{d}{c}$ & $\frac{d}{c}\sqsupset\frac{f}{e}$ tum $\frac{b}{a}\sqsupset\frac{f}{e}$.

Prop. XIV.

Si $a:b::c:d$ & $a\sqsubset c$ tum $b\sqsubset d$, $\frac{b}{a}=\frac{d}{c}$; ergo $b\sqsubset d$, per Arit. *Def.* 40. *Co*

Schol.

Si $\frac{b}{a}\sqsubset\frac{d}{c}$ & $a\sqsubset c$, tum $b\sqsubset d$, nam si b tum (per Arith. *Def.* 40. *Cor.* 2.) $\frac{b}{a}$ contra Hyp.

Prop. XV.

$a:b::xa:xb$. nam $\frac{xb}{xa}=\frac{b}{a}$, per A *Prop.* 20. *Cas.* 3.

N°. IV.

)IALECTICA *Petri Rami.*

§ 1.

)E Logica Peripatetica consulendus *De Vries* & *Corn. Agrippa* de Vanitate Arim.

§ 2.

Dialectica *Rami* (quamvis *Aristoteli* adversas est) concinnior tantum ac succinctior Diaticæ Peripateticæ Species videtur: In hoc ecellens, quod Usus cujusq; Partis (si ullus) per se magis appareat.

Prop. XXI.

Si $a : b :: e : f$ & $b : c :: d : e$ & $a \begin{smallmatrix}\sqsubset\\=\\\text{vel}\\\sqsupset\end{smallmatrix}$

tum $d \begin{smallmatrix}\sqsubset\\=\\\text{vel}\\\sqsupset\end{smallmatrix} f$, pari ratione.

Prop. XXII. & XXIII.

Eædem ſunt ac Arithmeticæ *Def.* 54. *Cor.* 3.

Prop. XXIV.

Si $a : c :: d : f$ & $g : c :: h : f$ Tum $a + g : c :: d + h : f$. Nam (per *Euc. Ax.* 2.) $cd + ch = af + gf$.

Prop. XXV.

Si $a : b :: c : d$ & $a \sqsubset b$ tum $a + d \sqsubset b + c$.

Demonſtratio.

1 $a : b :: a - c : b - d$, (*Euc.* V. 19.) vel alternatim $a : a - c :: b : b - d$.

1|2 $a - c \sqsubset b - d$, per *Euc.* V. 14.

2|3 $c + d + a - c \sqsubset c + d + b - d$, per *Euc. Ax.* 4.

3|4 $a + d \sqsubset c + b$, per Arith. Pr. 2.

N°. IV.

IALECTICA *Petri Rami.*

§ 1.

E Logica Peripatetica consulendus *De Uries* & *Corn. Agrippa* de Vanitate Ar-

§ 2.

ılectica *Rami* (quamvis *Aristoteli* adversa- :) concinnior tantum ac succinctior Dia- e Peripateticæ Species videtur: In hoc ılens, quod Usus cujusq; Partis (si ullus er se magis appareat.

§ 3.

§ 3.

Ramus Dialecticam distribuit in Inventionem Argumentorum & Judicium.

§ 4.

Argumenta desumuntur ex Causis, Effectis, Subjectis, Adjunctis, Diversis, Oppositis, Comparatis, Testimonio, &c.

§. 5.

Hi Loci, quos tractat, ad Inventionem sublevandam nonnunquam forsan prosunt; viz. si de quovis Subjecto, Sermone abunde disserere, & garrula Loquacitatis Ostentatione disputare velis: Et potius Rhetoribus quam Logicis inserviunt: Ideoq; *Cicero* Librum de Topicis conscripsit: Verum sincero Rationis Exercitio, in Veritate invenienda, quomodo inserviunt prorsus ignoro.

§ 6.

Judicium est vel Axiomaticum vel Dianoeticum. Axiomaticum unicas tractat Propositiones, easq; vel affirmatas, vel negatas, universales, vel particulares, &c.

§ 7.

Dianoeticum seu Discursivum est cum Axioma ex Axiomate deducitur: In eo spectandus Syllogismus & Methodus, in qua consideratur ut clarius praecedat, obscurius sequatur, &c.

Vide *Rami* Logicam.

Collier's Dictionary, sub Voce *Ramus*.

Hooker's Ecclef. Polity; Lib. I. § 6. p. 13.

Qui Bavium non odit amet tua carmina Mævi. No.

No. V.

ROMANCES.

ROMANCES are Hiſtories or Deſcriptions, for the moſt part profeſſedly fabulous, embelliſh'd with much Art, contriv'd and dreſt up in order to move.

Heliodorus is ſaid to be the firſt Inventor of them.

The moſt remarkable Kinds of them are.

I. Knight-Errantry-Romances, which treat of Knights full of Love and Courage, who ſtroll'd arm'd about the World, attended by a ſingle Squire, to ſeek Adventures, kill Giants and Monſters, deliver enchanted Ladies, and maintain to the Teeth of every Oppoſer that their Miſtreſs was the faireſt in the World. Theſe abound much in Miracles, Enchantments, and other Improbabilities.

Of this Kind the Scriblers have been almoſt infinite; v. g. *Pariſmus*, *Valentine* and *Orſon*, &c. And it is an old Way of Writing.

II. The more modern French amorous Romances; ſuch as *Cleopatra*, *Caſſandra*, *Grand Cyrus*, &c. which refine upon the former Sort, by avoiding the Improbable, and by a Politer

Style: These have also more Softness, and make Love the chief End and Business of Man; and end in Weddings. The Time of the Action is seldom so much as a Year, tho' the Narratives of the Persons reach many Years back. Sir *Philip Sidney*'s Arcadia is of this Kind, but all Pastoral.

Novels are generally short Romances of this Kind, relating a single Story; and that of meaner Persons.

The Number of this Sort of Romances is great.

III. Didactick Romances, such as more aim at Instruction, and please in order to profit: And they are either Moral, as *Telemachus*; Divine, as *Boyle*'s Theodora; Philosophical, as *Bacon*'s Atlantis; or Political, as *More*'s Utopia.

Of this Sort the Number is but small.

IV. Comical design'd to move Laughter; as *Don Quixot*, *Tale of a Tub*, *Hudibrass*, *Rabelais*, *Scarron*, &c. This Kind is mostly satyrical, and of it there are not many Writers of Account.

No. VI.

N°. VI.

Ars Inventiva

RAYMUNDI LULLII.

§ 1.

ARS Inventiva seu combinatoria *R. Lullii* (Pantasophia etiam dicta) Epitome est (si Autoribus illius Sectæ Fides adhibenda) universæ Philosophiæ, cujus Beneficio omnia pervestigare & ad quævis cujuscunq; Argumenti quæsita docte & facunde respondere possis. Tractat

§ 2.

I. Principia ex quibus omne quod dici potest conflatur, *viz.*

1. Decem Signa interrogativa, sc. *Utrum? Quid? De quo?* &c.

2. Subjecta, sc. *Deus*, *Angelus*, &c.

3. Prædicata absoluta, sc. *Entitas*, *Bonitas*, *Magnitudo*, &c.

4. Prædicata respectiva, sc. *Ordo*, *Differentia*, &c.

5. &c. - - - - ut exhibet *Kriegsmannus*, licet diversi Autores diverse hæc tradant.

§ 3.

II. Combinationem Principiorum, cu
Lullius invenit quatuor Figuras.

1. Abſolutis Prædicatis conſtat, v.g. *Boni*
magna, Magnitudo bona.

2. Prædicatis reſpectivis, v. g. *Ordo di*
rens.

3. Abſolutis & reſpectivis, v. g. *Ordo*
bonus.

4. Triplicatis Prædicatis, ut, *Bonitas ma*
na eſt differens.

§ 4.

Porro Prædicatis ſic ſibi invicem combinat
jungit Subjecta & tandem interrogativa Sign
e. g. *Utrum Bonitas Mundi eſt æterna?*

§ 5.

Ad ſpecialiora ex generalibus elicienda unu
Principium ad alterum contrahendum eſt, e.
Bonitas magna, Bonitas durans; vel ſingula
bus Principia conjungenda, v. g. *Bonitas D*
Bonitas Petri.

§ 6.

Alii Termini etiam ad Principia *Lullia*
reducendi ſunt.

§ 7.

Praxis hujus Artis in eo eſt ut propoſita
Quæſtionem juxta omnes ſuos Terminos i
Tabella requiras, adjunctis quoq; per Comb
nationem aliis Principiis ad novos Conceptu
formandos; Concordantiam aut Contrariet

tem horum Conceptuum reſpicias: Ita quid reſpondendum ſit & Media in argumentandum invenies.

§ 8.

E. g. Sit Quæſtio *Utrum Terra moveatur?* Combinetur Terra cum Motu; iterumq; cum Gloria: Ita apparebit eſſe eſſentialiter glorioſam: Gloria autem definitur qua Res concupitum Finem nacta quieſcit: Ergo Terra non movetur.

Vide *Kriegſmanni* Pantaſophiam.

Agrippam de Vanitate Artium.

Baconum de Augm. Scien. Lib. VI. Cap. 2. adfin. & quæ diximus de *Rami* Dialectica.

N°. VII.

N°. VII.

HERALDRY.

§ 1.

HERALDRY treats of ſuch honorary Devices as Gentlemen have ſeverally Right to bear on Shields, Atchievments, Funeral Eſcotcheons, Seals, Coaches, Utenſils, *&c.*

§ 2.

In the Coat bearing thoſe Devices are to be conſidered

I. Its Shape; which may indifferently be either an *Eſcotcheon*, or an *Oval Shield*, (which in Carving is ſwell'd;) but the Coat of ſingle Ladies is in Form of a *Lozenge.*

§ 3.

II. Its Colour; now the Field (*viz.* the whole Surface of the Eſcotcheon or Shield) according to its Colour, is call'd, *Or*, *Argent*, *Sable*, *Gules*, *Azure*, *Vert*, or *Purpure*; which are in black and white ſignify'd by Points, white Paper or various Friezings.

In blazoning the Arms of Nobles, correſpondent Names of precious Stones are us'd, as *Topaz*, *Pearl*, &c. And in the Arms of

's the Names of Planets, as *Sol*, *Lu*-
:.

§ 4.

en the Field is of two Colours, the of difpofing them is various; as *Ermine*, *Potent*, *Checky*, *Party*, &c.

§ 5.

s a conftant Maxim not to lay Colour lour: *i. e.* Nothing in the Charges muft the fame Colour with the Field.

§ 6.

The Points of the Efcotcheon, each honourable than other: As *Dexter-chief*, *'e-chief*, *Sinifter-chief*; in which feveral ;es are placed.

§ 7.

Charges born on the Field whether als, Vegetables, or any Device whatfo- Of which the Works of Art are leaft rable. Thofe Charges, that are peculiar raldry; are call'd *Ordinaries*; viz. *Crofs*, *Pale*, *Bend*, *Feffe*, *Efcotcheon*, *Chevron*, e, and *Bar*.

§ 8.

The Variations of the Ordinaries; as they are faid to be *wavy*, *voided*, *crenelle*, *lled*, *flory*, &c. Many Variations alfo be- o common Charges; as Beafts are faid to *npant*, *couchant*, &c.

§ 9.

The Differences, whereby the ſeveral Branches of a Family, and alſo the ſeveral Sons of one Family, are diſtinguiſh'd; *viz.* a *File, Creſcent, Mullet, Martlet*, &c. As a Martlet within a Creſcent ſignifies the Fourth Son of the Second Branch.

§ 10.

VII. That the Wife's Coat is *impaled* with the Husbands, while ſhe lives; and if ſhe be an Heireſs, for ever: The Man's being placed on the Right Hand; but if he have ſeveral Wives, in the middle.

§ 11.

VIII. When the Coat is marſhal'd at large, the *Mantles* at the Sides, the *Helmet, Wreath, and Creſt*, on the Top of it (as the Warriors bore them in the Field) but in the Coats of Nobles, a *Coronet* or *Crown* ſupplies the Place of a *Wreath*.

§ 12.

The Arms of Nobles have alſo *Supporters*.

§ 13.

Crowns, Coronets, and Helmets, are varied according to the Perſon's Quality.

§ 14.

Under the Coat is frequently put a *Motto*.

§ 15.

IX. The Order of *Blazoning* or reading a Coat; *Firſt*, The Name of the Field; then the

he Charge charged in, upon, or with another.

See the Sheet of *Heraldry*.
Harris's Lexicon.
Corn. Agrippa of Vanity of Arts.
Some Book of *Heraldry* that blazons Coats.

No. VIII.

METAPHYSICA

DE VRIES contracta.

Hanc autem Scientiam in Vita humana ego 'plane inutilem esse judico; imo noxiam: 'etenim tollantur primo ea quæ ad *Logicam* 'proprie & necessario, ex una parte, perti-'nent; eaq; quæ ad *Theologiam*, ex altera: 'Quod superest, nil nisi operosa & inutilis 'Terminorum, Notionum, Verborum, Ab-'stractionum, Farrago erit. *Oweni* Theologoum. Lib. I. p. 69.

CAP. I.

De Metaphysica in Genere.

§ I.

METAPHYSICA est Scientia explicans ista Prædicata quæ Rei cuilibet onveniunt, in quantum ea Ens est. Ali-

Aliter definitur Scientia Entis quatenus Ens.

§ 2.

Axiomata Metaphysica sunt quæ sequuntur:

Impossibile est idem simul esse & non esse.

Nihili nullæ sunt Affectiones

Nihil est Principium sui ipsius.

Nihil est in Effectu quod non ante fuerat in Causa.

Agere supponit esse. &c. Quæ innatæ Veritates dicuntur.

§ 3.

Ens est quod habet veram Existentiam; vel quodcunque in Rerum Natura datur, Nemine cogitante.

Ens & existens sunt Voces synonimæ; & in Entis Descriptione definitur Concretum per Abstractum.

Essentia & Existentia sunt Verba synonima.

§ 4.

Si dubitatur de Themate aliquo an existat, attendendum est ad Causas ejus, Effectus, Adjuncta, &c. Si enim existunt, Ens est; nam Non-Entis nullæ sunt Affectiones.

§ 5.

Non-Ens, seu Ens Rationis, est quod nullam veram habet Existentiam; sed non est Nihil purum: Nihil purum enim est quod neque existit, neque concipi potest.

☞ Non-Ens est quid medium inter Ens & Nihil, & Non-Entia sunt Notiones Logicæ.

§ 6.

§ 6.

Inter infinitas Species Non-Entium tractat *De Vries* has quinque, Possibilia, Relationes, Denominationes externas, Privationes, Negationes.

§ 7.

Possibile dicitur aliquid vel intrinsice (i. e. Quicquid absq; Contradictione potest concipi: Et semper eadem est talis Possibilitas, ob immutabiles Rerum, ratione Prædicatorum essentialium, Ideas) vel extrinsice (i. e. Quicquid per Potentiam alicujus Causæ potest produci: Variatur vero plurimum hujusmodi Possibilitas, pro varia Causarum Sufficientia) illi opponitur Impossibilitas, huic actualis.

§ 8.

De Relationibus vide *Burgesdicium.*

§ 9.

Denominationes externæ sunt Modi quidam id de Re aliqua prædicandi, quod illi ipsi qua tali proprie non competit, sed tantum de ea dicitur respectu ad aliquid illius Rei; v. g. Causam, Adjunctum, &c.

§ 10.

De Privationibus & Negationibus, vide *Burgesdicium.*

CAP.

CAP. II.

De Attributis Entium Simplicibus.

§ 11.

ATTRIBUTA sunt Prædicata Conceptum Entis qua Entis ita sequentia, ut de eo, per ipsam Entis Essentiam, sint demonstrabilia.

Non sunt Accidentia vel Modi (nam hæ Species sunt Entis quibus Attributa etiam tribuuntur) sed Modi quidam Ens concipiendi. Affectiones quoque vocantur; & sunt aut simplices aut disjunctæ.

§ 12.

Affectiones simplices sunt quæ singulæ seorsim cum omni Ente ita convertuntur, ut totam ejus Latitudinem exhauriant: Disjunctæ sunt quæ binæ disjunctim sumptæ cum Ente reciprocantur.

¶ 2. § 13.

Attributa simplicia sunt UNITAS, VERITAS, BONITAS, Alicubi & Aliquando.

§ 14.

Unitas est Negatio Divisionis alicujus Entis in plura qualiacunque.

PROPOSITIO.

Omne Ens est unum.

DE-

DEMONSTRATIO.

1. Si Ens non ſit unum, erit utique plura.

1 | 2. Ergo non jam amplius Ens ſed Entia. *Q. E. A.*

PROPOSITIO.

Omne Ens eſt ab alio quolibet diviſum.

DEMONSTRATIO.

1. Si non diviſum foret, eſſet & hoc quod eſt & ſimul aliud.

1 | 2. Ergo plura eſſet, non unum. *Q. E. A.*

COROLL.

Unum & idem ſunt Verba ſynonima, ut et Identitas & Unitas.

§ 15.

Identitas vel Unitas eodem modo diſtinguitur quo Diverſitas in *Burgeſdicio.*

§ 16.

Univerſales Naturas exiſtere aſſerunt Scholaſtici, & reſtringi ad Individua per Hæcceitates; id vero negat *De Uries.*

§ 17.

Veritas tranſcendentalis ſeu Metaphyſica (ſeu Rei, ut diſtinguitur ab illa Mentis & Sermonis) eſt Conformitas Rei cum Conceptu ſui eſſentiali. Conceptus eſſentialis Rei eſt Idea Rei in Mente divina, quæ immutabilis eſt.

PROPOSITIO.

Omne Ens eſt verum.

DEMONSTRATIO.

1. Deus ſapiens & potens quæque ſecundum Ideas ſuas producit.

1 | 2. Ergo omne Ens est verum.

§ 18.

Deus est verus independenti quodam Modo, ut in se continet Perfectiones omnes quas sibi debitas sua Mente comprehendit.

§ 19

Arte-factorum Veritas est Analogica, sc. Correspondentia Ideis Artificis: Quatenus autem ab eis deflectunt non sunt Arte-facta.

§ 20

Bonitas Metaphysica est Conformitas Entis cum Voluntate divina approbante: Opponitur Malitiæ.

Omne Ens bonum esse probatur simili Argumento quo verum esse.

§ 21.

Perfectum dicitur Ens ut possidens omnia Prædicata ratione & Intellectus & Voluntatis divini sibi debita: Continet & verum & bonum.

Perfectum & Completum idem significant.

§ 22.

Prædicata ista etiam singula seorsim Perfectiones dicuntur. Sunt vel essentiales, quæ Essentiam Rei constituunt; vel accidentales, quæ tantum ad Rei bene esse pertinent.

Sunt etiam vel extensivæ seu Partium, vel intensivæ, seu Graduum.

Sunt etiam vel absolute tales, quæ nil nisi Perfectionem notant; vel secundum quid, quæ Perfectiones dicuntur tantum in certo Subjecto, habita fere ratione Imperfectionis, in cujus Compensationem est concessa Perfectio. § 23.

3. ¶

§ 23.

Alicubi eſt Exiſtentia Entis in ſuo Ubi. Ubi autem Non-Ens eſt, & conſideratur cum Relatione ad Corpus ut vel actuale vel poſſibile: Ut Ens alicubi eſſe ſit idem ac eſſe ubi Corpus eſt vel eſſe poteſt.

§ 24.

Omne Ens eſt alicubi; nam quod nullibi eſt non eſt.

§ 25.

Dei Ubi eſt repletivum, Creaturarum definiivum.

§ 26.

Aliquando eſt Exiſtentia Entis in aliquo, Quando, vel quatenus Initium accipit vel duando perſeverat exiſtere.

§ 27.

Aliquando eſt vel momentaneum (quod notat ndiviſibile Momentum) vel permanens, Duraio quoque dicta.

Duratio eſt vel ſimultanea (ſc. Æternitas ſine Partibus & Succeſſione, Deo propria) vel ucceſſiva, quod Tempus audit.

CAP. III.

De Attributis Entium disjunctivis.

§ 28.

DISJUNCTÆ Affectiones sunt independens & dependens ; necessarium & contingens, infinitum & finitum.

§ 29.

Independens est quod ita per se sibimet sufficit ut ad suum Esse præter se requirit nihil, quæ & Aseitas dicitur, & est Prædicatum positivum.

Dependens est quod quomodocunque semet ipsum alteri a se diverso debet, tanquam alicui ad suum esse requisito.

§ 30.

Independentia est vel absoluta (sc. quæ Dependentiam omnimodam removet) vel secundum quid, quæ aliquem tantum Dependentiæ Modum removet : e. g. Spiritus non dependit a Partibus integrantibus.

§ 31.

Præcipua Species Dependentiæ est Causati a Causa : De his vide *Burgersdicium.*

DE

PROPOSITIO.

In Causarum Subordinatione non datur Progressus in Infinitum, sed ducimur ad Causam primam independentem.

DEMONSTRATIO.

1. Omnis Series Causarum est ab altera saltem Parte finita.
2. A Partibus etiam constat.
3. Et in Dies augeri potest.
1 & 2 & 3 | 4 Ergo nequit esse infinita. *Q. E. D.*

PROPOSITIO.

Causa annihilans non est revera Causa.

DEMONSTRATIO.

1. Conservatio positivum Influxum denotat
2. Annihilatio contradictorie opponitur Conservationi.
1, 2, | 3 Annihilatio est merus Non-influxus.
3 | 4 Ergo non revera Causa. *Q. E. D.*

§ 32.

Altera Dependentiæ Species est Compositi a Partibus.

Simplicitas est Prædicatorum omnium quæ in Ente aliquo concipi possunt vera a Parte Rei Identitas.

Compositio denotat plurium Rerum Multitudinem unitam.

§ 33.

§ 33.

Pars quæ alteram perficit per modum Actus ſeſe habet; quæ vero ab altera perficitur per modum Potentiæ. Actus eſt igitur Perfectio Potentiam complens.

§ 34.

Deus Actus purus alio Senſu dicitur, ſc. pura puta Perfectio.

§ 35.

Compoſitionis Genera ſunt ex Partibus eſſentialibus, integrantibus, ex Subjecto & Adjuncto. Plura videre eſt in *Burgeſdicio* de Toto.

¶ 4.

§ 36.

Neceſſarium eſt quod aliter ſe habere nequit ac de Facto habet: Contingens quod poteſt aliter ſe habere.

§ 37.

Modi Rei aliter ſe habendi ſunt, 1. Ratione Exiſtentiæ. 2. Attributorum. 3. Operationum.

§ 38.

Neceſſarium ratione Exiſtentiæ dicitur quod ſic exiſtit ut non poſſit non exiſtere.

Contingens quod poſſit non exiſtere.

Poſſibile ſic non exiſtit ut poſſit tamen exiſtere.

PROPOSITIO.

Omne Contingens eſt dependens.

DE-

DEMONSTRATIO.

1. Contingens non per se determinatur ad existendum potius quam ad non existendum.

| 2. Ergo per Causam extra se ex qua dependit determinatur.

§ 39.

Necessarium ratione Attributorum vel Operationum dicitur quod nequit non esse tale quale est, nec potest non operari quando vel quod operatur.

§ 40.

Immutabile & mutabile idem sonant ac necessarium & contingens.

PROPOSITIO.

Mutabile est quoque compositum.

DEMONSTRATIO.

1. Quod simplex est aut totum simul manere aut totum tolli necesse est.

| 2. Ergo quod mutatur compositum est.

PROPOSITIO.

Immutabilitas Perfectionem denotat per se, & Mutabilitas Imperfectionem.

DEMONSTRATIO.

1. Mutatio fit vel in id quod tantundem est, vel in deterius vel in melius.

2.

2. Prima Species Mutationis inutilis, secunda & tertia Imperfectionem denotant.

1.2 | 3. Valet Propositio.

Per Accidens tamen Mutatio Perfectionem aliquando denotat, quatenus Ens mutatum acquirit Perfectionem qua antea caruit: Hæc vero Perfectio est tantum secundum quid non absoluta.

§ 41.

Necessitas operandi est extrinseca vel intrinsica, de qua vide *Burgesdicium* de Causa necessaria: Et eodem recidunt hæ Distinctiones *Simplex & secundum quid*, *Absoluta & hypothetica*, *Consequentis & Consequentiæ.*

§ 42.

Finitum est quod patet aliquousque non ulterius, ideoque quo magis dari potest

Infinitum quod patet quousque patere potest, ideoque quo magis dari nequit.

Infinitum a Parte sui denotat quid Positivum (sc. exundantem absq; Mensura Plenitudinem) & Finitum quid negativum.

PROPOSITIO.

Infinitum non constat finitis Partibus.

DEMONSTRATIO.

1. Partis ad Totum datur Proportio.

2. Finitæ Partes ad Totum Infinitum nullam habent Proportionem.

1 2 | 3. Valet Propositio.

PROPOSITIO.

Quicquid aliquo modo infinitum est, omnimodo est infinitum.

DEMONSTRATIO.

1. Res infinitæ nullam habent Proportionem ad finitas.

1 | 2. Mixtura ex Finito & Infinito in illis concipi nequit. *Q. E. D.*

§ 43.

Indefinitum non est Medium inter Finitum & Infinitum, quæ contradictoria sunt; sed significat nos nescire ubi Fines Rei sunt.

§ 44.

Infinitivum vero negative a nobis concipitur, quanquam est Attributum positivum in se.

§ 45.

Coronidis Loco lubet subjicere Quæstionem unam vel alteram sublimiorem a *De Vries* prætermissas.

Qu. 1. Quomodo differt Potentia sese annihilandi ab Aseitate negativa?

Qu. 2. Quomodo differt Hæcceitas qua Materia prima Spirituum restricta est a Quidditate Individuorum?

Qu. 3. An Chimera bombistans in Vacuo potest comedere secundas Intentiones?

Qu.

Qu. 4. Ponatur Humanitatem equitare in E
quinitatem & Petrietatem, equitare in Buce
phaleitatem, ſi Curſu contenderent utra ſupe
raret ?

Qu. 5. Si Bucephaleitas ſepararetur ab Equi
nitate utri iſtorum adhærebit Hinnibilitas?

Vide *Clerici* Ontologiam.

N°. IX.

N°. IX.

MECHANICA

De Sex POTENTIIS.

DEFINITIO I.

MOMENTUM seu Quantitas Motus est Rectangulum ex Quantitate Materiæ in Velocitatem ducta. i. e. $M = Q \times V$.

DEF. II.

Velocitas est Quota Spatii percursi per Tempus divisi. i. e. $V = \frac{S}{T}$

COROLL.

Velocitates duorum Corporum motorum sunt in Ratione Spatiorum eodem Tempore percursorum.

AXIOMA I.

Momenta Corporum motorum ſunt ut Vires generantes: Vide *Newtoni* Prin. Ax. 2.

COROL.

Vires Corpora æqualia moventes ſunt ut Spatia eodem Tempora percurſa: Per *Def.* 1. & *Def.* 2 *Cor.*

DEF. III.

Gravitas eſt Vis deorſum ferens.

AXIOMA II.

Corpora omnia, ejuſdem a Terræ Centro Diſtantiæ, æquali Velocitate a Vi Gravitatis impelluntur; niſi Reſiſtentia Fluidi aut alio modo impediantur: Ut in Vacuo compertum eſt. Imo Corpora graviora in Aere juxta Superficiem Terræ fere eadem Velocitate deſcendunt: Vide Keill Phyſ. Theor. IX. p. 99.

COROL.

Gravitates Corporum ejuſdem a Centro Diſtantiæ ſunt ut Quantitates Materiæ: Per *Def.* 1. & *Ax.* 1.

DEF. IV.

Pondus Corporis eſt Reſiduum ſuæ Gravitatis, Reſiſtentia Fluidi ſublata, ſc. quo deorſum actu fertur: Et eſt in diverſis Fluidis diverſum.

SCHO-

SCHOLIUM.

Cum exigua sit Aeris Resistentia, Corporum graviorum, in Aere juxta Superficiem Terræ, Pondera sunt fere, ut Quantitates Materiæ: Per Ax. 2 Corol.

2 ¶

PROPOSITIO I.

Corpus Viribus conjunctis Diagonalem Parallellogrammi eodem Tempore describet quo Latera separatis.

CONSTRUCTIO.

Si Corpus dato Tempore, Vi sola M, ferri potest ab A ad B (vide *Fig.* 1.) &, Vi sola N, ab A ad C; compleatur Parellellogrammum AD: Et Vi utraque feretur eodem Tempore ab A ad D, in Linea AD.

DEMONSTRATIO.

1. Concipe Corpus moveri in AB, & Lineam AB interea moveri, sibi semper parallellam, in Directione parallella ad AC: Tum Vis N agens secundum Lineam AC, ipsi BD parallellam, nihil mutabit Velocitatem accedendi ad Lineam illam BD, a Vi altera genitam.

1 | 2. Accedet Corpus eodem Tempore ad Lineam BD sive Vis N imprimatur sive non.

2 | 3. In Fine illius Temporis reperietur alicubi in Linea BD.

4. Eodem Argumento in Fine Temporis ejusdem reperietur alicubi in Linea CD.

3 4 | 5.

3, 4 | 5. In utriusque Lineæ concursu D reperiatur necesse est.

5 | 6. Si Punctum quodlibet G in AD sumatur, & compleatur Parallellogrammum AG; tum ob similia Parallellogramma AD & AG quo Tempore Vi M Corpus ad F pervenire posset, Vi N ad E perveniret & utrisque conjunctis ad G.

6 | 7 Corpus pertranseat Punctum quodlibet G Lineæ A D (i. e. in Linea AD moveatur) necesse est.

5, 7 | 8 Valet Propositio.

COROL.

Hinc invenitur Vis directa æquipollens duabus obliquis & vice-versa: Per Ax. 1 Cor.

¶ 3.

PROPOSITIO II.

Si de Rotæ alicujus Centro O exeuntes Radii inæquales OM & ON Filis MA & NP sustineant Pondera A & P, quæruntur Vires Ponderum ad movendam Rotam.

CONSTRUCTIO.

1. Per Centrum O (vide *Fig.* 2.) agatur Recta KOI, Filis perpendiculariter occurrens in K & I.

2. Centro O, Intervallorum OK OI majore OI, describatur Circulus occurrens Filo MA in D.

3. Actæ Rectæ OD Parallella sit AC, & perpendicularis DC, & compleatur Parallellogrammum.

Dico

Dico Vim Ponderis A ad movendam Rotam esse ad Vim Ponderis P ad eandem movendam ut A×OK ad P×OI: sc. ut Rectangula Ponderum × Radios in directum positos.

DEMONSTRATIO.

1. Quoniam nihil refert utrum Filorum Puncta K, I, D affixa sint vel non affixa ad Planum Rotæ, Pondera idem valebunt ac si suspenderentur a Punctis K & I vel D & I.

Constr. | No. 1, 3, *Euc.* I. 29. & I. 32 Cor. 2 | 2 Angulus KDO=DAC: Anguli OKD & DCA recti & Angulus ADC=KOD.

2, *Euc.* VI. 4 | 3 OK: DO [vel OI] : : DC: DA.

Prop. I. Cor. | 4 Vis tota Ponderis A, ad D suspensi (qua certo Tempore Corpus A percurreret DA) æquipollet Viribus quibus idem Corpus Lineas DC & DE eodem Tempore percurrere potest.

5. Vis in Directione DE nihil valet ad movendam Rotam.

4, 5, 1 | 6. Vis Ponderis A idem valebit ad movendam Rotam ac Vis in Directione DC, quæ sit ad Pondus A ut DC ad DA.

7. Vis illa in Directione DC, trahendo Radium DO perpendiculariter, idem valebit ad movendam Rotam ac si Radium OI (ipsi OD æqualem) perpendiculariter traheret.

7 | 8. Vis Ponderis P, ad I suspensi, ad movendam Rotam est ad Vim Ponderis A ad idem ut

Pondus

Pondus P ad Vim dictam in Directione DC.

6 | 9. Vis illa in Directione DC $= \frac{A \times DC}{DA}$

1, 8, 9 | 10. Vires Ponderum ad movendam Rotam sunt ut P ad $\frac{A \times DC}{DA}$ i. e. ut $P \times DA$ ad $A \times DC$ i. e. (per grad. 3) ut $P \times OI$ ad $A \times OK$. Q. E. D

¶ 4

COROLL. I.

Si A : P :: OI : OK (i. e. si Pondera sunt reciproce ut Radii in directum positi) tum $A \times OK = P \times OI$ & Pondera idem pollebunt & Rota in Equilibrio consistet.

COROLL. II.

Vires Ponderum *Stateræ Romanæ* appensorum ad Stateram movendam sunt ut Pondera × Distantias suas a Centro.

COROLL. III.

Vis Potentiæ Manualis ad *Vectem* movendum est ad Vim Ponderis ad Idem ut Potentia × suam a Fulcro Distantiam ad Pondus × suam Distantiam.

Hic enim, ob similia Triangula ABC, DEC (vid. *Fig.* 3 & 4) per *Euc.* I. 15 & 32. Cor. 2. Distantiæ sunt ut Radii in directum positi. *Euc.* VI. 4.

COROLL.

COROLL. IV.

Vis Potentiæ Manualis ad movendum *Axem cum Peritrochio* eſt ad Vim Ponderis ad idem ut Potentia × Radium (vel Longitudinem) Axis ad Pondus × Radium Peritrochii.

5 ¶

PROPOSITIO. III.

Quæruntur Vires Cunei Iſoſcelis ad Lignum findendum?

CONSTRUCTIO.

In Cuneo CBE (vide Fig. 5.) producatur Linea Directionis qua Vis Mallei imprimitur EX, quæ Latitudini Cunei BC perpendicularis ponitur: deinde a C, extremo Puncto unius Faciei Cunei, ducantur duæ Lineæ duabus Faciebus perpendiculares, occurrentes Lineæ EX in A & D, & compleatur Parallellogrammum.

Dico Vim qua Cuneus Malleo impulſus urget ambas Ligni Facies eſſe ad Vim qua Cohæſio utrinque urget Cunei Facies ut Vis Mallei × Longitudinem Faciei ad Vim Cohæſionis utrinque × dimidiatam Latitudinem Cunei.

DEMONSTRATIO.

Conſtr. § 1. Propter Angulum ECX=CAX (ſi alterutri enim addis ACX rectus conficitur) & Angulus E=ACD (ſi alterutri enim addis ECD rectus conficitur) Triangulum ACD eſt Cuneo ſimile: Et eadem Ratione Triangulum ABD eſt Cuneo ſimile & ipſi ADC æquale & congruum.

§ 2

L | 2. AD : AC (=AB) :: CB : CE (=EB per *Hyp.*) & AC (=AB) $= \frac{AD \times CE}{CB}$.

Conſt. Prop. 1 | 2. Vis Mallei, per AD expoſita, æquipollet Viribus AC & AB Cohæſionis Viribus directe contrariis; viz. quibus Cuneus directe urget Ligni Facies.

2, 3 | 4. Vis qua Cuneus urget duas Ligni Facies eſt ad Vim qua Cohæſio urget Facies Cunei utrinque (ſeu Viribus Cunei reſiſtit) ut AC+AB (=2AC) ad Vim Cohæſionis: i. e. (per gr. 2.) ut $\frac{2AD \times CE}{CB}$ ad Vim Cohæſionis: i. e. ut AD×CE ad XC × Vim Cohæſionis. *Q.E.D.*

COROLL.

Si AD (ſc. Vis Mallei) : Vim Cohæſionis :: XC : CE tum Potentia & Reſiſtentia æquipollent.

¶ 6

PROPOSITIO IV.

Quaeruntur Vires Cunei Rectanguli ad Corpus movendum, Directione perpendiculari ad Altitudinem Cunei?

CONSTRUCTIO.

Poſitis quæ ſupra & inſuper producta BA, (vide *Fig.* 6.) donec AF æquetur ipſi DC.

Dico

Dico Vim qua Cuneus Pondus perpendiculariter urget esse ad Vim Gravitatis Ponderis ut Vis Mallei × Altitudinem Cunei ad Pondus × Latitudinem Cunei.

DEMONSTRATIO.

Pr. 1.| 1. Vis qua Cuneus urget Pondus in Directione AC, per AC exposita, æquipollet Viribus AD (quæ contranititur Machinæ Resistentiæ, qua ne aliter quam perpendiculariter moveatur Pondus providetur) & AF, vel DC, quæ directe Gravitati Ponderis contranititur.

2. Pari Ratione ac in Dem. præc. gr. 1. patebit Triangulum ACD esse Cuneo simile: ideoq; AD. DC :: DC: DE & DC $= \frac{AD \times DE}{DC}$

1, 2 | 3. Vis qua Cuneus Pondus perpendiculariter urget est ad Vim Gravitatis Ponderis ut DC (i. e. $\frac{AD \times DE}{DC}$) ad Pondus: i. e. ut Vis Mallei (AD) ×DE ad Pondus ×DC *Q. E. D.*

COROL.

Si Vis Mallei sit ad Pondus ut DC ad DE tum Potentia & Resistentia æquipollebunt.

7 ¶

PROPOSITIO V.

Vires Cochleæ *invenire.*

E CONSTRUCTIO.

CONSTRUCTIO.

1. Cochlea æquipollet Cuneo Rectan (cujus Latitudo æquatur duarum cont proximarum ſpiralium Converſionum Inter lo, ſecundum Longitudinem Cochleæ æſtim & cujus Altitudo æquatur circulari Cochle pheriæ) per Axem in Peritrochio (viz. M brium in Cylindro Cochleæ inſertum) imp

Accuratius vero loquendo Cochlea ex in tis Cuneis Latitudine æqualibus Altitudin æqualibus conſtat.

2. Omnes hi Cunei ponantur æquipol Cuneo medio (ſeu ei quæ Altitudinem h mediocrem) Vi tota impreſſo.

Dico Vim Potentiæ ad Manubrium appli ad movendam Cochleam eſſe ad Vim Pond ad idem ut Potentia × Manubrii Periphe ad Pondus × Intervallum duarum Spiral Converſionum.

DEMONSTRATIO.

Conſtr. Pr. 4 | 1. Si Vis quævis Malleo primatur Directione Tangentis ad dictum dium Circulum, tum Vis, qua Pondus, ſe dum Longitudinem Cochleæ, per Malleum gebitur eſt ad Pondus ut Vis Mallei × Peri riam medii illius Circuli ad Pondus × Inter lum duarum ſpiralium Converſionum.

Prop. 2 Cor. 4 | 2. Potentiæ ad Manubrii *tremitatem* applicatæ Vis ad Cochleam mo *dam eſt* ad Vim Mallei (ad Tangentem Cir

icti applicatam) ad idem ut Potentia × Radium Manubrii ad Vim Mallei × Radium dicti medii Circuli: i. e. ut Potentia × Peripheriam Manubrii ad Vim Mallei × Peripheriam Circuli illius medii.

2 | 3. Compositione Rationum, Vis Potentiæ ad Manubrium applicatæ ad movendam Cochleam est ad Vim Ponderis ad idem ut Potentia × Peripheriam Manubrii ad Pondus × Intervallum duarum spiralium Conversionum Q. E. D.

COROLL.

Si Intervallum dictum sit ad Peripheriam Manubrii ut Potentia ad Pondus, tum Potentia & Resistentia æquipollebunt.

8 ¶

PROPOSITIO VI.

In Trochleis *ut Potentia* × *Numerum Funiculorum, quibus Pondus suspenditur, est ad Pondus sic Vis Potentiæ, ad Trochleas movendas, ad Vim Ponderis ad idem.*

DEMONSTRATIO.

Prop. 2. Cor. 3 | 1. Duorum Funiculorum, æqualibus (a Puncto in Vecte quo Pondus suspenditur) Distantiis, alteruter dimidiato Pondere premitur: Si enim alteruter ceu Fulcrum concipiatur Vis æqualis dimidiato Ponderi æquabitur Pressuræ in alterum

1 | 2. Tantum premuntur dicti Funiculi quantum premerentur si Pondus utrisq; conjunctis in medium Vectem suspenderetur.

413. Si pluribus Funiculis duabus Ve tremitatibus, æqualibus à Centro Di affixis (modo Numerus hinc & illinc Pondus suspendatur, imo si unus ve Centro affigatur, omnes Funiculi æ prementur.

414. Pressio in singulos Funiculos in T æquatur Ponderi diviso per Numerum lorum quibus suspenditur.

415. Cum Machina provideatur ut tibus Trochleis Pondus continenter æ Funiculos premat; Vis Potentiæ ad il niculum quo movetur Machina trahend e, ad Pondus sustollendum) est ad Ponde sistentiam ut Potentia ad Pondus per N Funiculorum divisum: i. e. ut Potenti merum Funiculorum ad Pondus. Q. E

COROL.

Si Potentia = Pondus : Numer niculorum, tum Potentia & Resistent pollent.

PROPOSITIO VII.

In sex Potentiis Vis Potentiæ ad mo Machinam est ad Vim Ponderis, ut idem tia × Velocitatem suam ad Pondus × Vel suam.

DEMONSTRATIO.

I. In *Statera, Vecte & Axe in Per* Velocitates sunt ut Arcus descripti:

.e. ut Circuli descripti: i. e. ut Radii lorum, seu Distantiæ a Centro vel Ful- Ergo in his valet Propositio. *Prop.* 2. *Cor.*

4.

In *Cuneo Isosceli* si sola Vi Potentiæ ur- ır Pondus vel Lignum; sc. si non daretur sio Partium Ligni anteriorum a posterio- ; moveretur Pondus non in Circulo, sed in ione AC; & Velocitas Potentiæ esset ad itatem Ponderis ut AE ad AC: i. e. (ob Triangula) ut CE ad CX: Ergo &c.

5.

In *Cuneo Rectangulo* Velocitas Potentiæ Velocitatem Ponderis ut Altitudo Cunei itudinem: Ergo &c. *Prop.* 4.

In *Cochlea* Velocitas Potentiæ est ad Ve- tem Ponderis ut Peripheria Manubrii ad allum duarum spiralium Conversionum: &c. *Prop.* 5.

In *Trochleis* seu *Polypastis* Velocitas Po- est ad Velocitatem Ponderis ut Numerus ulorum, quibus Pondus suspenditur, ad 1. m omnes simul Funiculi uno Pede decur- , Funiculus ductorius totidem Pedibus r fit quot sunt Funiculi quibus suspendi- ndus: Ergo &c. *Prop.* 6.

COROLL.

ex Potentiis si Potentia: Pondus:: Ve- Ponderis: Velocitatem Potentiæ tum nia consistet in Æquilibrio.

No. X.

N°. X.

HYDROSTATICA.

DEFINITIO I.

FLUIDUM est Corpus omne cujus Partes cedunt Vi cuicunq; illatæ & cedendo facile moventur inter se.

DEF. II.

Corpora dicuntur esse *æqualis*, *majoris* vel *minoris specificæ Gravitatis*, quum sub eadem Mole parem, majorem vel minorem habent Gravitatem.

PROPOSITIO I.

Fluidi immoti Pars quævis æqualiter premitur undique.

DEMONSTRATIO.

Si magis in aliquam Partem prematur in eam movebitur; contra Hypothes.

PRO-

PROPOSITIO II.

Fluidi immoti Partes omnes, a Centro Terræ æqualiter distantes, æqualiter deorsum premuntur: (ideoq; undiq; Prop. 1.) i. e. ejusdem sunt specificæ Gravitatis, Def. 2.

DEMONSTRATIO.

1. Particulam specifice graviorem diffluere subter leviores ejusdem Strati nihil prohibeberet, nisi forte Gravitas Particulæ Mole æqualis, quam interim ascendere oportet.

1 | 2. Contranituntur sibi mutuo Gravitates Particularum Mole æqualium, iisdem a Centro Terræ Distantiis, & si inæquales sint Motus succedit; contra Hypoth.

SCHOLIUM.

Fluidi vero homogenei immoti Partes, diversis a Centro Terræ Distantiis, non æqualiter premuntur; quia superiores premunt inferiores.

¶ 2

COROLL. I.

Particula quævis Fluidi vel quodvis Corpus solidum (i. e. cohærens) Fluido immersum, si ejusmodi est specificæ Gravitatis ac Fluidum, quiescet; si majoris, subsidet; si minoris, assurget.

COROLL. II.

Corpus specifice levius infra Fluidum demersum supernatabit; & Pars demersa Magnitudine æquatur Moli Fluidi toti Solido Gravitate pari.

CO-

COROLL. III.

Specifica Gravitas Solidi immersi est ad spe-cificam Gravitatem Fluidi ut Pars Solidi de-mersa ad totum Solidum.

COROLL. IV.

Sit GH (vide *Fig.* 7.) Superficies Fluidi cu-jusvis, ab alio sibi incumbente æqualiter pres-sa; si qua ejus Pars, v. g. AB, quovis modo a eo Pressu liberetur, v. g. Ope Tubi, Partes Tu-bæ subjectæ ascendent; idq; donec Pars Super-ficiei AB tantum prematur a Fluido evect quantum reliquæ Partes a Fluido incumbente

PHÆNOMENA HYDROSTATICA

Per J. E.

I.

SYRINX constat e Fistula & Embolo, cujus Pars inferior est orbicularis & Caviti Fistulæ accurate aptata ita ut Aer per Latera se insinuare nequeat: Immisso ergo cuivis Fluido Syringe & adducto Embolo, Pars Aquæ Orificio subjecta Pressu Aeris liberatur & ascendit.

N.B. Superficies Fluidi cujusvis tantum premitur ab Aere intra Vas quodvis quantum premeretur ab Aere externo quocum communicat (Prop. II.) vel quocum non communicat; modo ejusdem sit Elasticitatis & Toni. Aer enim internus Vi sua elastica tantum præstat ac totum Columen Aeris externi præstaret.

3 ¶

II.

ANTLIA sic se habet, vide Fig. 8.

K ... F Manubrium

Manubrium G versando elevatur Situl[a]
bilis (Lateribus ita accurate aptata ut
insinuare se nequeat) una cum Valvula [F]
Foramen subjectum aperiente vel clau[dente]
prout deprimitur aut elevatur. Situla si[c]
tracta simul summovetur Aer Aquæ C in[cum-]
bens, a cujus ergo Pressura liberatus Aer [a]
per Foramen subjectum Valvulæ D sursum [pres-]
sæ, ascendet usque ad Fundum Situlæ,
Valvula F etiamnum claudit Foramen s[ubjec-]
tum; utpote fortius ab Aere incumbente
ab Aqua ascendente pressa.

Manubrium modo contrario versando d[epri-]
mitur Situla, adeoq; fortius premit Aqua[m si-]
bi contiguam. Hac Situlæ Depressione a[peri-]
tur Valvula F: Valvula autem D simul cl[audi-]
tur: Per Foramen idcirco ad F ascendet
super Situlam deorsum pressam.

Manubrium iterum contrario versando
Situlam supergressa propellitur per Orif[icium]
H; succedente Aqua per Foramen subje[ctum]
Valvulæ D, iterum sursum pressæ ob rem[otum]
Pressum & Aeris & Aquæ supergressæ Si[tulam]
elevando. Quia autem hoc continuo fit c[on-]
tinuus fiet effluxus.

III.

Per SUCTIONEM ascendent F[luida]
in Tubos sive rectos sive recurvos: Nam i[n]
ni Expiratione animali Cavitas Thoraci[s per]
suos Musculos minuitur & Pulmones co[mpri-]
muntur; inde effluit Aer contentus p[er]
Anim

Animalis. At in omni Inſpiratione augetur Cavitas Thoracis, quo fit ut Aer externus irruat in Pulmones per Os & aſperam Arteriam: At Suctio eſt Inſpiratio; ergo Thorace aucto, Aer in Tubo ad Os applicato contentus irruit in Pulmones. Superficies vero Fluidi Orificio Tubi infero ſubjecta liberatur ab Aeris Preſſu; reliquæ autem Fluidi Partes premuntur ab Aere; ergo Aſcenſus fiet Fluidi in Tubum.

N. B. Fluida per Suctionem elevata ad certam tantum finitam Altitudinem aſcendent; quæ ſunt reciproce ut ſpecificæ Fluidorum aſcendentium Gravitates. V. g. *Aqua* ad Pedes 33: *Argentum vivum* ſeu *Mercurius* ad Digitos 28: *Mercurius* enim eſt 14 Vicibus ſpecifice gravior quam Aqua.

IV. 4 ¶

TUBUS TORRICELLIANUS eſt Tubus Vitreus uno Extremo clauſus, Mercurio repletus. Altero extremo Digito obturato immergatur in Vaſculo Mercurii pleno & dimoveatur Digitus ab Orificio intra ſtagnantem Mercurium merſo. Si Tubus exſtet ſupra Mercurium ſtagnantem altior 28 Digitis, eouſque dilabetur Mercurius Tubo contentus; ſi depreſſior, manebit plenus: Preſſus enim Aeris externi æquat Pondus Mercurii 28 Digitos alti.

1 Immergatur Tubus una cum Vaſculo Mercurii Aquæ, aſcendet Mercurius adhuc $\frac{1}{14}$ Altitudinis Aquæ ſupra Mercurium: Preſſus enim Aquæ additur Preſſui incumbentis Aeris.

Quo altior evehitur Tubus, conſcenſis altiſſimis Montibus, eo magis deprimitur Mercurius & vice verſa; eo enim Preſſus Aeris major vel minor redditur.

Gravitas ſeu Preſſus Aeris non ſemper ejuſdem eſt Gradus; unde modo altior modo depreſſior eſt Mercurius contentus; qui hoc modo indicat Gradus hoſce Gravitatis varios, Nomenq; conſecutus eſt *Baroſcopii.*

V.

In TUBO REFLEXO Fluidum in utriſq; Cruribus ad eandem Altitudinem aſcendet, modo alterum Orificium non ſit nimis anguſtum. Nam Preſſus Fluidorum ejuſdem ſpecificæ Gravitatis ſunt ut Altitudines perpendiculares.

Hinc Scaturigo Genio relicto non aſcendet ſupra Fontem.

Occluſo Orificio B (vide *Fig.* 9.) impleatur Tubus ex altera Parte; claudatur A; & nihil Aquæ effluet ex Orificio B iterum reſerato, ſi CA minor ſit 33 Pedibus; ſin major ſit, effluet. Nam in primo Caſu Superficies Aquæ ad C minus premitur ab Aqua quam B ab Aere.

¶ 5

VI.

INVERSO TUBO reflexo Aquæ pleno & Orificio Cruris brevioris in Vaſculum Aqua repletum immerſo, tandem remoto Digito ab A, (vide *Fig.* 10.) fit Fluxus continuus.

Nam

Nam Aqua DA descendet, per Prop. II. Cor. 1. &c, cum BD minor sit 33 Pedibus, Aqua e Vasculo ascendens ultra D premitur; Aer enim non potest intrare Orificium A ad Ascensum impediendum; quia nequit ascendere Aer nisi impedito Descensu Aquæ per A, quæ impellitur Pressu Aeris in Vasculum — Pondere Aquæ BD + Pondere DA; Vi nempe majore quam Pressus Aeris in A, cum DA longior sit quam BD.

Idem accidet (Tubo non prius impleto) exsucto Aere ex Orificio A: Tum enim Pars Aquæ Orificio B subjecta, reliquis minus pressa, ascendet ad D; quæ etiamnum protrusa ab Aqua nova succedente defluet ad A.

Immerso Orificio A in Vasculum Aqua plenum, prius impleto Tubo, tardius exit Aqua in Vase, quam cum Orificium A in Aere exstaret: Imo Celeritas Effluxus continuo decrescit. Altitudo enim Crurum super Superficies Aquarum in Vasculis ad Æqualitatem continuo propius accedit; ideoq; Aqua in utroq; Vasculo, ad eandem Altitudinem redacta, subsistet Effluxus.

Utroq; Orificio in Aere simul aperto, effusa quidem est Aqua; sed si angustus est Tubus per Crus longius tantum, per illud vero semper celerius.

6 ¶

VII.

BULLA VITREA Colli & Orificii angusti, Pondere appenso ita librata ut Super-

ficiei paulum innatet, affusa Aqua ad CD, (vide *Fig.* 11.) usq; ascendet sibi libere relicta; quæ etiamnum specifice levior Aqua; sed detenta sub Altitudine AB, inter novam Aquam affundendam, tandem Fundum petit: Nam, per Aquæ affusæ Pondus, Partes sub Orificio F magis sursum pressæ Aerem conclusum in minorem Locum cedere cogunt; unde *Bulla* una cum Aere & Aqua admissa fit gravior Mole Aquæ pari.

Eodem recidit si Vas occlusum sit & aliquo Modo comprimatur Aqua & Aer inclusus.

Loco Aquæ denuo affusæ, paulatim infuso Oleo in *Bullam* libere innatantem, *Bulla* tandem Fundum petit; quia specifice gravior est Oleo; proinde summum petere nequit: Quinetiam Pondere Olei affusi Guttulæ aliquæ Aquæ per Orificium F intruduntur & gravior fit *Bulla*.

VIII.

CAMPANA *Urinatoria Scoticana* (vide *Fig.* 12.) erat plumbea 30 Digitos alta, totidem Orificium ejus, Pondus *libr.* 260: Non demergi potuit nisi prius appenso Scabello plumbeo, Ponderis *libr.* 130. E Campana demersa egrediebatur Urinator & Tormenta bellica e Fundo Maris sustulit; iterum ingrediebatur ad novum Spiritum hauriendum. Campana Aerem quæ Respirationi per Horam integram sufficeret continebat.

Non demergi potuit Machina priusquam specifice

cifice gravior Aqua: Nam ob parallellam Campanam Exitus Aeri non dabatur.

Quo altior demergebatur Campana eo propior ad Maxillas afcendebat Aqua; quo major enim Altitudo Aquæ incumbentis, eo magis comprimebatur Aer.

* *

No. XI.

SECTIONES CONICÆ.

§ 1.

SI ab extrema Parte Lineæ *d* (i. e. *Axis*) Punctum movetur, defcribens Lineam curvatam in Partes ipfius *d* &

o defignat Lineam a Puncto quovis Figuræ defcriptæ perpendiculariter in Axim immiffam, *Ordinatam* dictam;

a Lineam jacentem inter Extremitatem Axis prædictam (i. e. *Verticem* Figuræ) & Pedem Ordinatæ, quæ Linea *Abfciffa* audit; fc. ut *a* & *o* fint Quantitates fluentes;

p Quantitatem quamvis fixam, *Latus rectum* feu *Parametrem* dictam: Tum Dico

§ 2.

Si $oo = pa - \frac{paa}{d}$ perpetuo, *Ellipfis* dicitur Figura.

§ 3.

Si in *Ellipfi* $p = d$ tum $oo = da - aa$ & *Circulus* evadit; per *Eucl.* VI. 13. Cor.

§ 4. Si

§ 4.

Si in *Ellipsi* Axis d infinita evadit tum $oo = pa$; & *Parabola* dicitur.

§ 5.

Si in *Ellipsi* Axis d est negativa, h. e. æqualis $-l$ tum $oo = pa + \frac{paa}{l}$ & *Hyperbola* dicitur Figura. Insuper Axis in Partes contrarias jacet & $+l$ Hyperbolæ *Latus transversum* dicitur.

§ 6.

Hinc cumprimum in *Ellipsi* $a = d$ eo ipso o æquabitur nihilo & Figura Axem intersecat & in sese tandem revertitur.

§ 7.

In *Parabola* vero & *Hyperbola* o nunquam æquabitur nihilo sed in infinitum crescit, neque unquam Figura recurret in Orbem.

§ 8.

Ellipsis *Foci* dicuntur duo Puncta, a Verticibus æquidistantia, a quibus duæ Lineæ ad quodlibet Peripheriæ Punctum ductæ simul sumptæ æquantur Axi. In *Circulo* Foci in Centro coincidunt. In *Parabola* Linea jungens Focum finite distantem & Punctum quodlibet Peripheriæ æquatur suæ Abscissæ una cum Linea inter illum Focum & Verticem.

§ 9.

Ut has Figuras ceu *Coni Sectiones* consideres vide

HARRIS's *Lexicon Technicum.*

No. XII.

'HTSIOGNOMIA.

Ecclus. XIX. 19, 20.

§ 1.

IN Corporis Humani Crasi considerandi sunt

I. CALOR, qui Inventioni, Iræ, Fortitudini, Libidini inservit: Rhetores, Poetas, Artifices efficit agaces reddit Homines.

Dignoscitur per Crines rubentes; Oculum us Color in Nuce castanea vel Arbore Cory- vel Croco apparet, celeriter moventem.

§ 2

II. FRIGIDITAS, quæ cautos Homines dit.

Dignoscitur per Crines Coloris lutei, & Ocu- n Cœruleum.

 § 3.

§ 3.

III. SICCITAS, quæ acri Judicio inservit & Philosophos efficit: Hæc autem vel nobiscum nascitur, vel Adustione provenit.

Dignoscitur per Crines subfuscos, Oculum cæsium-subobscurum fortiter moventem.

§ 4.

IV. HUMIDITAS, Memoriæ tenaci inservit: Gramaticos, Historicos, &c. efficit.

Dignoscitur per Crines albicantes, molles, flaccidos; (si etiam oleosi sunt præstantis Memoriæ Indicium est) Oculum albicantem.

§ 5.

Crasis *Puerorum* est calida & humida; *Juvenum* calida & temperata; *Virorum* calida & sicca; postea temperata & sicca; deniq; *Senum* frigida & sicca; quod etiam Studia intensiora effici possunt.

§ 6.

Crasis humana est.

I. TEMPERATA, quæ variis Disciplinis æque adaptata est; vix in ulla vero præcellit: nec Iræ nec Mulieribus nimis dedita.

Dignoscitur per Crines Colores quem Natura exhibet, ab aureo non abhorrentia, (non illi, qui a Candido per Frigorem immutatus provenit, dissimilis;) Oculum, cujus Stratum est cæsium-subobscurum exquisite mixtum; in quod Color Arboris Coryli suffunditur, in quem rursus Color Nucis-castaneæ, in quem deniq; forsan paululum Coloris crocei explicatur;

tur; Vocem claram & gratam; Staturam mediocrem; Corpus læve sine Hirſutia; Vultum rubicundiorem.

2 ¶

§ 7.

II. CHOLERICA, ſc. calida & ſicca; quæ acri Judicio & Inventioni inſervit: Superbos, callidos, magnificos, hilares, libidinoſos Homines reddit: A Verboſitate abhorret: Salibus Satyricis tantum gaudet: Sapientiores quam videntur eſſe præſtat.

Dignoſcitur per Crines ſpiſſos, ſurdos, criſpatos, duros, Oculum ſubanguſtum, cæſium-ſubobſcurum, ſubrutilo perfuſum; Vocem duram; Paululum Carnis.

Calor nimius vero Inventionem perturbat & Cholericis optime agitur cum non emoti ſunt.

§ 8.

Sin autem Siccitas ex Aduſtione per nimium Calorem provenit, tum Vindicta gaudetur; & per Intervalla cruciatos Animo Homines reddit.

Dignoſcitur per Caput nigrum, calvum; Oculum ignicantem; Vultum Coloris Olivæ; Carnem duram & hirſutam; Venas prægrandes.

Calvities frequenter etiam a Cerebro terraneo inutili provenit.

§ 9.

III. SANGUINEA, ſc. calida & humida, quæ Inventioni Memoriæq; mediocri (plurimus enim

enim Calor exficcat Corpus) infervit: Lepidos urbanos non multum Veneri addictos, in Narrationibus fælices, cachinnantes, minus tamen fapientes quam videntur effe Homines reddit.

Dignofcitur per Crines fubalbicantes, a Rubedine vero non prorfus abhorrentes, & fpiffos; Oculum cæfium-candidiorem, Colore fub-flavo leviter perfufum, fatis amplum, delicate moventem.

§ 10.

IV. MELANCHOLICA, fc. ficca & Frigida quæ Prudentiæ infervit.

Dignofcitur per Crines fufcos-fubobfcuros; Oculum cæfium-fubobfcurum, cæruleo Colore perfufum, tarde moventem.

§ 11.

Melancholia Hypochondriaca non eft Crafis, fed Intemperies quædam; cui fingulæ Crafes obnoxiæ funt; nobifcum nafcitur &

Dignofcitur per Motum Oculi minime fpontaneum.

§ 12.

V. PHLEGMATICA, fc. frigida & humida, quæ nulli Rei eximiæ infervit, nifi Memoriæ. Optime agit Phlegmaticus cum permotus eft.

Dignofcitur per Crines furdos, fubalbicantes; Oculum albicantem, cæruleo perfufum.

§ 13.

Balbuties præceps & reduplicativa ex magna

Siccitate

Siccitate cum nimio Calore conjuncta provenit.

§ 14.

Signa præcipue observanda

I. In *Oculo* sunt Color, Magnitudo, Forma, Motus & Spiritus: Tria priora autem qua Via tendit Ingenium indicant; Motus vero & Spiritus quousq; valeat: In prioribus Signis conveniunt Ingenia vulgaria & eximia; in ultimis duobus nequaquam.

§ 15.

II. In *Vultu* Nasus, Vertex, Maxillæ, Supercilia, at præcipue Vox.

§ 16.

III. In *Corpore* Cutis, Caro, Figura, Incessus.

Vide *Huartis* Examen di Ingenios.

Philosoph. Transac. *Lowthorp.* Vol. III. Cap. I. § 5. Cap. III. § 1.

Betterton's Life, p. 41, 42.

No. XIII.

No. XIII.

FORTIFICATION.

§ 1.

HAVE at Hand *Harris*'s Lexicon for Definitions; the Sheet of *Military Architecture* and *Fortifications* in Clay or Wood.

§ 2.

A regular Fortification has the Bastions at its Angles so near as Musquet Shot, viz. 120 Fathoms; for the Line of Defence must not exceed: And therefore, if the Curtain is too long, a flat Bastion is made in the middle.

§ 3.

Every Place within the Fortification ought to be flank'd and defended by some other.

§ 4.

The Fortress must command all round about: Therefore the Outworks must be gradually lower than the great Ramparts and all outward

Works

Works lie open to the inward, left when taken they serve the Enemy.

§ 5.

The Face of a Bastion must not be less than half the Curtain, that it may be sufficient to defend it.

§ 6.

When Water hinders carrying on the Bastion to its full Extent, or its Angle at Front would be too sharp, 'tis cut or tenailled.

§ 7.

Dry Ditches are best for great Places, for Sallies and Succours and they are not liable to the Danger of Frost; provided they be so deep that they cannot be undermin'd for Water.

§ 8.

Before a Lodgment where a Breach has been made the Mines of the Besieged must be found out and emptied by Countermine, lest you be blown up: But in the inmost Works, this Precaution being almost impossible, the Besieged are threaten'd to have no Quarter if they spring Mines. The Fougades are made in Haste.

§ 9.

To countermine the Face of a Bastion the Ditch must be cross'd with a Gallery and the Artillery of the opposite Flank dismounted.

§ 10.

Bastions with large Gorges are best for Retrenchments; which are made hastily to retreat into when the Bastion is taken.

§ 11.

Saps are us'd to take the Cover'd-way when its dangerous to proceed above Ground.

§ 12.

Approaches are favour'd by Madriers, Gabions &c. which the Besieged endeavour to fire with pitch'd Faggots.

§ 13.

The Miner crosses a wet Ditch in a floating Bridge.

§ 14.

A Dry Ditch is to be fill'd with Fascines, for the Army to pass: And a wet Ditch also, if not too deep; otherwise 'tis cross'd with Pontoons or a Bridge of Boats.

* *

No. XIV.

ARCHITECTURE.

THE RULES of Architecture are to observe

I. *Solidity*, viz. A good Foundation and sound Materials.

II. *Convenience*, viz. The disposing of the Parts so as not to embarrass one another.

III. *Beauty*.

IV. *Order*, or the due Disposition and Union of the Parts.

V. *Proportion* of the Parts to the whole.

VI. *Decorum*, with respect to the Design or Use of the Edifice, with respect to Custom; with respect to Convenience; as to have the Windows,

dows of a Bedchamber to the East.

II. *Oeconomy*, as to Expence and the Qua- of Materials which the Country affords.

§ 2.

e ORDERS of Architecture are only in ct of the *Pillars*: They are Five, *viz.* *Tuscan*, *Dorick*, *Ionick*, *Corinthian*, and osite or *Roman*: For though others have devis'd, none are allow'd so good as these herefore not reckon'd.

§ 3.

Pillar or Column has 3 Parts,

The Pedestal, consisting of { Base, Die, Cornich.

The Pillar it self consists of { Base, Shaft, Capital.

I. Entablature or Ornament consists of - - - - - - { Architrave, Frieze, Cornich.

e the Plate of Architecture in *Harris's* con.

§ 4.

e Shaft of a Pillar is commonly round, ometimes square.

§ 5.

e 5 Orders differ

As to the Proportion of their Parts.

e Length of the Tuscan Pillar, i. e. of Pillar it self, is 7 Diameters of the Bottom

of the Shaft and the Shaft is taper'd to $\frac{3}{4}$ o
its Diameter at the Bottom.

The Dorick is 8 Diameters.

The Ionick 9.

The Corinthian and Roman 10.

§ 6.

II. In the Parts themſelves.

The Dorick has its Baſe and Capital mor beautify'd with Mouldings than the Tuſcan It has on each of its 4 Friezes the 3 *Strings* o *Apollo*'s Harp, with Drops under them on th Architrave.

The Ionick has its Capital ſet off at th Corners with 4 *Voluta's* or curled Scrolls. It usually channell'd in the Shaft with 24 Flute

The Corinthian has 2 Rows of *Leaves* on it Capital, with Stalks ſhooting out in 8 littl Voluta's.

The Roman differs from the Corinthian b the Addition of the angular *Voluta's* of th Ionick to the *Leaves* of the Corinthian, leav ing out the little Voluta's.

The Tuſcan wants all theſe Ornaments.

Theſe are the principal Differences ſelecte out of many.

§ 7.

The Tuſcan is the plaineſt; 'tis us'd in ru ſtick Edifices or vaſt Piles for Variety; as in Amphitheaters.

The Dorick is for Strength and is uſed in *great* and maſſy Buildings. The

The Ionick improves upon the Dorick in Neatneſs.

The Corinthian and Roman are the fineſt and richeſt.

§ 8.

Pilaſters are incompleat Pillars, that jut out of the Wall a Part of their Breadth only; have commonly ſquare Shafts and are frequently placed behind Pillars. They are diſtinguiſh'd into 5 Orders as Pillars are.

§ 9.

When there are 2 Stories of Pillars the lighter Order is ſet over the heavier; as the Corinthian above the Ionick.

See *Harris*'s Lexicon.

Cornelius Agrippa de Vanitate Art.

Sturmy's Matheſis juvenilis.

No. XV.

No. XV.

De HERBIS

Quatenus ad Medicinam ſpectant.

§ 1.

UT Herbam aliquam certo Nomine deſignatam ab omnibus aliis ſimilibus diſtinguas, obſervanda ſunt Figura, Color, Sapor, Odor, &c. Radicis, Foliorum, Florum & Seminis, &c.

§ 2.

Obſervetur in quali Solo creſcant ſingulæ naturaliter & quali poſſint, quali etiam non poſſint enutriri.

§ 3.

Ut etiam qua Anni Tempeſtate primo pullulent, matureſcant, Flores edant, &c. Aliquibus vero Maturatio vix competit; ſtatim enim poſtquam apparuerint evaneſcunt.

§ 4. Ut

§ 4.

Ut etiam quæ Partes Herbæ utiles sint: A-
|uarum enim Radix, aliarum Folia, aliarum
ores, aliarum Semen, aliarum hæc omnia vel
lem vel diversis utilia sunt.

§ 5.

Quando legendæ sint scito calleas. Radices
iæ Tempore verno, aliæ Autumno. Folia
eridie, antequam Semen maturescat. Flores
ii in Germine, alii maturi, nulli decidui le-
ndi sunt.

A Medicis *Astrologicis* etiam prospicitur ut
tis Horis Planetariis singulæ colligantur: V.
ut Herba in quam dominatur *Jupiter* Hora
si Planetæ subdita carpatur.

§ 6,

Antiquitus Herbæ in callidas & frigidas di-
ributæ erant; quæ Distinctio nunc Dierum in-
ta habetur; quia ex frigidissimis Spiritus a
hymicis extrahitur.

§ 7.

Spectandus omnino Herbarum Usus quoad
ngulas Corporis Partes: Observant etiam Su-
erstitiosi quidam Signaturas, i. e. Similitudi-
em Herbæ certis Corporis Partibus; unde U-
um futiliter admodum augurantur.

§ 8.

Quantitas etiam cujusq; in Medicamine su-
nenda spectatur, pro Hominis cujusq; Ætate,
Temperie, &c. Aliæ Herbæ plus valent aridæ,
deo Quantitas minor sufficit; aliæ Virentes.

2 ¶ § 9.

§ 9.

In quibusq; Herbis Chymice invenitur *Phlegma* seu *Aqua*, *Oleum* seu *Sulphur*, *Spiritus* seu *Mercurius*, *Sal* & *Caput mortuum*. Vide *Harris*'s Lex. in Verbo *Principles* & in Verbis singulis ibi recensitis.

§ 10.

Phlegma in distillando prius assurgit, nisi Herbæ exsiccentur, Odorem & Saporem Herbæ retinens & parvi inter Medicos habetur.

Deinde assurgit Spiritus, deinde Oleum cum Sale volatili Lateribus Vasis adhærente. Oleum vero primum omnium in Herbis exsiccatis assurgit.

Rursus Lixivio ex Cineribus facto & cocto, dum Aqua in Vapores abit, restat Sal fixus.

Cineres ipsi post Lixivium factum sunt Caput mortuum seu Terra damnata nihilo utilis.

§ 11.

Nullum vero Corpus in Principia ne ad minimum cum se invicem mixta resolvi potest.

§ 12.

Chymicis Operationibus aliæ Herbæ magis aptæ sunt virentes, aliæ exsiccatæ.

§ 13.

Considerandum etiam Periculum quod Herba ægrotantibus intentat, vel ex nimia Quantitate, vel ex diversis ejus Qualitatibus, (aliis quidem salutiferis aliis vero venenosis) ut Venenum Antidoto corrigatur.

Aliæ Herbæ extus applicatæ juvant, intus *vero sumptæ* venenosæ sunt.

No. XVI.

Hypothesis Malebranchii *Omnia in Deo videndi.*

§ 1.

OBjectorum Cognitionis Humanæ unum, Deus scilicet, a seipso innotescit; nimirum quod Mentem intime penetrat.

Alia Mentis Conscientia dignoscuntur; viz. propriæ cujusq; Mentis Operationes.

Alia per Conjecturam; cum ea quæ nescimus iis quæ scimus similia esse ducimus.

Alia per Ideas; viz. Sensibilia extra nos posita.

§ 2.

Ideæ autem nostræ ab una aliqua subsequentium Origine Ortum suum recipiunt, vel

I. Ab Anima producuntur. Mens vero nec alis Potentiæ nec Modi quo producuntur est nullo *modo conscia.* Vel

§ 3. II.

§ 3.

II. Universa Idearum Supellex simul c[um] Anima a Deo creatur: Quod si ita est, qua I[ra]tione obsecro ex hac Turba Ideam ullam Me[nti] proxime sistendam eligamus? Porro quorsu[m] Deum Entium Numerum infinitum simul c[um] Animabus nostris creasse ponamus, cum Hy[po]thesi magis simplici Res solvi possit? Vel

§ 4.

III. IpsaObjecta eas producunt:Quaenam v[e]ro Motus cum Cogitatione Affinitas? Nihil en[im] percipit Anima nisi quam-intima Unione s[ibi] conjunctum: Unio vero Corporis cum Spir[itu], cum nullam habere possint Proportionem, impossibilis. Vel

§ 5.

IV. Deus eas producit, quotiescunq; aliqu[od] Objectum Mentem occupat: Confusas ve[ro] quasdam Ideas Rerum omnium semper Me[nti] praesentes esse necesse est; cum Arbitrii nos[tri] sit de quovis Objecto cogitare: Nequaquam [i]gitur Ideae successive producuntur prout in Me[n]tem veniunt. Vel §6.

V. Omnes Perfectiones, quas per Ideas su[as] percipit, in se complectitur Anima ideoq; seipsa eas percipit: Hoc vero Dei peculiare Attributum: Imo constat Animam Perfect[io]nem *Infinitatis*, cujus Ideam habet, nequaqu[am] in se complecti. Vel

§ 7.

VI. Anima cum Ente perfectissimo, Deo

qui omnes Perfectiones Entium creatorum continet, unitur; Ille Locus est Spirituum sicut Spatium est Locus Corporum: Hac Ratione Anima id in Deo percipit quo Corpora Modo quodam spirituali repræsentantur. Omnes Ideæ particulares sunt tantum Restrictiones Ideæ Creatoris. Neq; Ideis nostris inest Defectus, Captui vero Mentis; utpote angustiori quam ut universas Ideas complecti possit.

§ 8.

Hæc ultima Hypothesis hoc Modo demonstratur.

Deus sibi est Finis præcipuus; omnia sibi operatur: Quicquid igitur Luminis habemus huc solum tendit ut quid in Deo sit intelligamus. Si *Sol* in immediatum Cognitionis nostræ Objectum nobis daretur, *Soli* non Deo conderemur.

Vide *Malebranche* Reserche de la Verite. Lib. III. Par. II. Cap. 6.

§ 9.

Hæc præclara Hypothesis mirum-quantum convenit cum illa æque præclara *Philosophi* de *occultis Qualitatibus*; nimirum Captum superat, secum pugnat, nec sapientiorem reddit quam Veritas illa cuivis obvia, *Legem esse Naturæ ut certa Idea certis Motibus in Cerebro Modo & Ratione inscrutabili succedant.*

Vide Lock's *Examinat. of* Malebranche § 10.

No. XVII.

De Sphæris nostris NEWTONIANIS, SIVE *ASTRONOMIA.*

CAP. I.

De Telluris intra Annum apparentibus Phænomenis.

§ 1.

EX Revolutione Telluris diurna provenit ut non *Sphara* sit sed *Spharoida oblata*, cujus Diameter Æquatorius exsuperat Axem circiter 60 Milliaribus Anglicanis.

Diameter Telluris mediocris est 7925 Milliarium.

§ 2.

Tellus movetur circa Solem Spatio 365 Die-

rum,

rum, 6 Horarum, 9 Minutarum, in Ellipsi, cujus Foci distant 2600000 Milliaria, viz. $\frac{1}{60}$ Longitudinis Ellipsis seu Orbis magni.

§ 3.

Movetur Tellus Situ sibi semper (quam proxime) parallello; unde provenit Vicissitudo Tempestatum, diversa Longitudo Dierum in Temporibus & Locis diversis; ut Conspectu Sphærarum discitur.

§ 4.

Partim ex Inclinatione Axis Telluris ad Axem Eclipticæ provenit Inæqualitas illa Dierum Synodicorum, in Tabulis Æquationum notata; nempe quia singulis Diebus, post Diem periodicum (respectu Stellarum fixarum) 23 Horarum 56 Minutarum peractum, restat percurrenda Æquatoris Pars major vel minor inter eosdem Meridianos, ac certa Pars Eclipticæ, quam Motu circa Solem singulis Diebus percurrit Tellus.

Partim vero hæc provenit ex Forma Orbitæ Telluris Elliptica & Inæqualitate Motus Telluris in diversis Orbitæ Partibus inde sequente.

§ 5.

In Hyeme nobis proximior Sol, at minorem Calorem sentimus; quia obliquius positi sumus ad Solem (Vide Fig. 13.) Nam licet AC=AB tamen cum Angulus ASB duplum sit Anguli ASC, duplum Caloris habet AB.

Adde Noctes Diebus longiores Calorem minuere.

CA

CAP. II.

De Telluris Phænominis non nisi post multos Annos apparentibus.

§ 6.

IN multis Revolutionibus Situs Telluris sensibiliter immutatur & Parallellismus (§ 3.) ruit; non quidem quoad Inclinationem Axis suæ ad Eclipticam; sed regrediuntur in Antecedentia Puncta Æquinoctialia & Poli Telluris: Imo revolvunt in 25920 Annis; quo redeunt Æquinoxia.

Hinc Annus Tropicus fit tantum 365 Dierum, 5 Hor, 49 Min. ab Anno Sydereo (§ 2.) deficiens 20 Minutis.

§ 7.

Linea Apsidum Orbitæ Telluris etiam lente progreditur, angulariter revolvens in 106920 Annis: Et nunc Temporis Perihelion Telluris est in Gradu 7 *Cancri*, & accidit 7 Dies post Solstitium brumale.

§ 8

Hinc sequitur Tempus venturum quando in Vere Sol apparebit in Constellatione *Libra*; sc. intra 12000 Annos: Et etiam

§ 9.

Aliquando Æquinoctium erit in Telluris Perihelio; & Hyems & Æstas æquidiuturnæ *evasuræ* sunt; (nunc enim octo Diebus distant) *sc. intra* 6000 Annos: Et etiam

§ 10

§ 10.

Aliquando Perihelion Telluris erit in oppo-o *Zodiaci* Signo; nempe intra 50000 Annos: niq;

§ 11.

Veniet Tempus quando Æstas erit in Perihe-& Hyems in Aphelio; unde proveniet ca-ior Æstas & Hyems frigidior; idem nempe od nunc accidit Incolis Partis Globi Austra-

§ 12.

Hæc Retrogradatio Æquinoctialium Puncto-n ut & Progressio Apsidum provenit ex Tel-is Figura Sphæroidica,

CAP. III.

De Luna.

§ 13.

UNA movetur circa Tellurem in Ellip-si, cujus Focus quam-proxime est in Cen-Telluris.

§ 14.

Faciem fere eandem Lunæ semper videmus: d non omnimodo eandem, Librationem enim bet & Longitudinis & Latitudinis.) Unde nstat eam moveri eadem Periodo circa Axem um *qua circa* Tellurem.

§ 15.

§ 15.

Nodorum Lunæ Orbitæ (seu Punctorum quibus intersecat Eclipticam) ille quem Luna transiens in Partes Boreales tendit, *Caput Draconis* vocatur: Alter quem transiens Luna in Partes Australes tendit, *Cauda Draconis* audit.

§ 16.

Linea Nodorum Lunæ revolvit angulariter in Antecedentia in fere 19 Annis; i. e. in Annis 18 & plusquam 10 Mensibus.

§ 17.

Linea Apsidum Orbitæ Lunæ bis progreditur & bis regreditur singulis Revolutionibus; at Progressu exsuperante, revolvunt Apsides Lunæ in Consequentia 9 Annis.

§ 18.

Lunæ Mensis Synodicus mediocris est 29 Dierum, 12 Hor. 44 vel 45 Minut. in quo Spatio recurrunt Novilunia.

§ 19.

Phases variæ Lunæ Conspectu *Sphærarum* discuntur.

CAP. IV.

De Eclipsibus.

§ 20.

EClipsis Lunæ accidit Positione Telluris inter Solem & Lunam: Hoc fit in Plenilunio

ɔ, quando Luna eft prope Nodum: Si in ɔdo ipſo, centralis eſt Eclipſis & totalis.

§ 21.

Tellus ipſa non obſcurat Lunam; (quia, per ·fractionem Atmoſphæræ Telluris, Radii So- , juxta Superficiem Telluris tranſeuntes, nveniunt cis Lunam) at Atmoſphæra Tellu- , ad Altitudinem 40 vel 50 Milliarium: ιο in Atmoſphæra adhuc ſuperiore Radii oq; refracti ſunt: Et etiam hæc Atmoſphæra perior Penumbram facit.

§ 22.

Eclipſis Solis, ſeu potius Telluris, evenit terpoſitione Lunæ inter Solem & Tellurem in ɔvilunio; modo prope Nodum ſit Luna: Si Nodo ipſo centralis Eclipſis: At ſi Tellus in rihelio eſt & Luna in Apogæo, non totalis :. Vide Fig. 14.

Habitantibus inter *y* & *y* ex parte ſaltem ob- ıratur Sol.

- inter *o* & *o* totaliter.
- inter *e* & *e* Sol quaſi Annulus apparet.
- apud *n* Solis Dimidium obſcuratur.

§ 23.

Tota Tellus nequit obſcurari, quia Tellus ajor Luna eſt.

§ 24.

Luna ipſa obſcurat Tellurem; (vide § 21) ıia Luna non habet Atmoſphæram craſſam ad frangendos Solis Radios: Unus vero *Whiſto-* *ıs* Lunam rariorem habere Atmoſphæram (e *Eclipſi* obſervaſſe aſſerit.

CAP.

CAP. V.

Planetarum primariorum Tabula.

	§ 25. Distantia mediocris a Sole juxta Milliaria Anglicana.	§ 26. Ratio Magnitudinis ad Magnitudinem Telluris.	§ 27. Tempus Revolutionis circa Solem in Consequentia; Annis, Diebus, Horis, & Sexagesimalibus Horæ i.e. Minutis expositum.
Saturnus.	777000000	600	29 174 6 0
Jupiter.	424000000	1728	11 317 12 0
Mars.	123000000	$\frac{1}{6}$	1 321 23 0
Tellus.	81000000	1	1 0 6 9
Venus.	59000000	fere 1	0 224 17 0
Mercurius.	32000000	$\frac{1}{7}$	0 87 23 0

§ 28. Tempus Revolutionis circa Axem proprium in Consequentia, respectu Solis, seu Dies Synodicus mediocris, Diebus, Horis & Horæ Sexagesimalibus expositus.	§ 29. Inclinatio Axis (circa quem singuli moventur) ad Orbitam Revolutionis circa Solem; Gradibus & Sexagesimalibus Gradus i. e. Minutis exposita.	§ 30. Inclinatio Orbitæ Revolutionis circa Solem ad Eclipticam, Gradibus & Minutis exposita.
gnoratur an circa Axem moveatur annon.	Si moveatur & Axis Annulo perpendic. tum 59 00	07 30
0 10 00	fere 90 00	
1 00 40	fere 90 00	
1 00 00	66 30	00 00
Si omnimodo oveatur, forn in 0 23 00	ignota est	03 22
noratur, *ut supra.*	ignota est	12 00

§ 31.

Sol eſt 885736tuplo major Tellure.

§ 32.

Lunæ Diſtantia a Tellure mediocris eſt 241328 Milliarium.

§ 33.

Lunæ Magnitudo eſt 1/50 Magnitudinis Telluris.

§ 34

Luna Tellurem ambit in Conſequentia 27 Diebus 7 Horis 43 Minutis.

§ 35

Sol circa Axem ſuam movetur 25 Diebus 12 Horis; quæ Axis ad Eclipticam inclinatur 87 1/2 Grad.

§ 36

Luna circa Axem ſuam movetur 27 Diebus 7 Horis 43 Minutis; (§ 14) quæ Axis ad Eclipticam ſemper inclinatur 90 Grad. ad Orbitam autem ſuam circa Terram varie: Orbita enim Lunæ varie ad Eclipticam inclinatur: Mediocris vero Inclinatio eſt 5 Graduum 8 Minutarum.

CAP. VI.

Observationes de Planetis in Sphæris nostris non exhibitis, Cometis, Solis Systemate et Stellis fixis.

§ 37

SAturnus habet quinque Satellites. Habet etiam Annulum (Phænomenon maxime mirandum) cujus Diameter est ad Diametrum ipsius Planetæ ut 2·25 ad 1. Latitudo ejus est eadem quæ Distantia a Planeta; viz. circa 22000 Milliaria. Profunditas ejus vix perceptibilis: Est forsan 500 vel 1000 Milliarium.

§ 38

Jupiter habet quatuor Satellites.

§ 39

Venus *Domino Cassini* Satellitem habere videtur.

§ 40

Mercurius raro apparet; (occultatur enim in Solis Radiis, ob parvam a Sole Distantiam) nisi in Solis Eclipsi & aliquando in Aphelio suo.

§ 41

Alios non dari Planetas inter Mercurium & Solem non constat: Si enim darentur nobis non visibiles essent.

§ 42

§ 42

Omnium Planetarum Orbitæ (fere circulares) continentur inter Zodiacum, a Sole 16 Gradus latum; (quamvis Zodiacum a Terra sit 20 Grad.) non multum inclinatum ad Solis Æquatorem.

§ 43

Cometæ circa Solem moventur aut in Parabolis aut in Ellipsibus valde excentricis. Cometarum Numerus quantum liquet est 21. Orbitas trium Cometarum Ellipticas esse fere in concessis est. Amplam habent Cometæ Atmosphæram, quæ reflectit Solis Radios & Caudam efficit.

§ 44

Cometa qui A. D. 1680 apparuit, revolvit circa Solem 575 Annis; in Aphelio a Sole distat 11200000000 Milliaribus: Neque ullum longius a Sole distare adhuc compertum est.

§ 45

Sol est quamproxime in communi Foco omnium Planetarum & Cometarum; verus autem Focus est Centrum Gravitatis pro Tempore Solis Planetarum & Cometarum omnium.

§ 46

Quoad Stellas fixas, trium, diversarum quidem apparentium Magnitudinum, Parallaxes annuas sibi mutuo æquales invenisse sibi videntur *Hookius* & *Flamstedius*; viz. 45 Minutarum secundarum. Unde Calculo usitato efficitur eas a Sole distare 7000000000000 Milliaribus

aribus. Attractio igitur Fixarum etiam Cometarum in Apheliis Cursum non multum deturbabit (§ 44) multo minus Planetarum. Hæc vero Parallaxis Fixarum infirmo niti Fundamento *Gregorio* videtur; cui respondit *Whistonus.*

§ 47

Vix 2000 Stellæ fixæ nudo Oculo cernuntur: Telescopio vero forsan decies vel vigesies plures.

§ 48

Si ad Amussim Rem dicerem, monerem non Tellurem, at Centrum Gravitatis Telluris & Lunæ, circa Solem in Ellipsi ferri; & id genus plura, quæ Tyro vix recipiet & tutò ignoret.

Vide *Harris*'s Lexicon pro Terminorum Sensu.

Sphæras nostras Newtonianas.
Whistons solar Systcm.

No. XVIII.

CHRONOLOGY.

§ 1

WHEN *Julius Cæsar* reform'd the *Pompilian Calendar*, and brought it to what we now call the *Julian Year*, or Year of the *Old Style*, he made that one Year 495 Days long, by 2 several Intercalations.

§ 2

The Number of the Days in each Month in a common *Julian* Year is express'd thus,

Thirty Days hath *September*
April June and *November*;
All the rest have Thirty one,
Except *February* alone.

For *February* has but 28. *January* is the first Month in the *Julian* Year. But the *English* and *Irish*, in the Accounts of Church or State, begin their Year *March* 25; and accordingly, for almost 3 Months, they call their Year one less than the rest of their Neighbours.

Prideaux Connect. Par. II. Lib. VII. p. 490—493. 8°.

§ 3

The common *Julian* Year, of 365 Days falls short of the Tropical (See Astronomy § 6) by 5 Hours 49 Minutes: Therefore every 4th Year the 6 *Calendas Martii*, or 23d of *February*, was by the *Romans* reckon'd twice over; and the

the last of these 2 Days was call'd the *Bissextile*, as was also the said 4th Year, to which by this Method a whole Day was added.

By the Moderns a 29th Day is added to *February*: So that the mean *Julian* Year is 365 Days 6 Hours; and exceeds the Tropical about 11 Minutes; and in about 130 Years gets before the Tropical a whole Day, and in 400 Years almost 3 Days.

§ 4

To find wether any Year of our Lord Old Style be Bissextile or not? Cast away all the Centuries; divide the rest by 4; and the Remainder shews how much the Year propos'd is past the Leap Year: V. g 1719—1700 divided by 4 shews (by the Remainder) that 1719 is the 3d after the Bissextile.

§ 5

Altho' the Tropical Year wants 20 Minutes of the Sydereal, (*Astron.* § 6) it wants but 11 of the mean *Julian*; (§ 3) and therefore the *Equinox* is almost as long again in revolving, with respect to the *Julian* Year, as it is running thro' all the Points of the Heavens. *Astron.* § 6.

§ 6

To find the Place of the Equinox in any Year of our Lord O. S? Make your reckoning from any Year in which it was exactly observed; as in 1584 (a Bissextile) *Tycho Brahe* observ'd it to be on *March* the tenth 30 Minutes after 9 at Night; viz. on the 70th Day

of

of the Year; and for every 4 Years after or before abate or add 44 Minutes: (§ 5) For every 100 Years 18 Hours, 28 Min. For every 130 Years about one Day.

§ 7

An *Epoch* or *Æra* is Years reckon'd from some remarkable Limit *a parte ante.* V. g. From the Beginning of the *World*; the Birth of *Christ*; the first *Olympiad*, &c.

And a *Period* or *Cycle* is an Epocha that is ended also by a fix'd Limit; and returns again perpetually.

§ 8

We number the Days of the Year by the first 7 Letters of the Alphabet perpetually recurring; the first of *January* being always call'd *a*, and therefore the last of *December* is *a*, in a common Year of 365 Days: For $\frac{365}{7}$ gives 52 Weeks and leaves 1 Day Remainder: But in Leap Year *March* is made to begin with the same Letter wherewith *February* ends.

§ 9

That Letter which *Sunday* falls on is the *Dominical* Letter of the Year: So that if the Dominical Letter this Year be A, the next Year 'tis G, the next after F: But in Leap-Year if the Dominical Letter in *January* be A, in *March* 'tis G; (viz. the next Letter backward;) the Bissextile having 2 Dominical Letters; and the next Year 'tis F.

§ 10

§ 10

All the Variety of Dominical Letters, were there no Leap-Years, would return after seven Years; but the Leap-Year having two (§ 9) and there being seven possible Combinations of the Domincal Letters, the Variety will not be out in less than twenty eight Years: Which twenty eight Years is call'd the *Cycle of the Sun*. § 7.

2 ¶

§ 11

The *Cycle of Indiction* is a Cycle of fifteen Years, taken from a *Roman* Custom of paying some Sort of Tribute. every fifteen Years.

§ 12

Whereas a Tropical Year exceeds twelve Lunar Synodical Months (which consist of three hundred and fifty four Days, and nine Hours nearly, *Aston.* (§ 18) by ten Days, twenty one Hours nearly; a mean *Julian* Year exceeds them by ten Days, twenty one Hours, eleven Minutes.

§ 13

Nineteen mean *Julian* Years (which are six thousand nine hundred and thirty nine Days, eighteen Hours) exceed two hundred and thirty five Synodical Months by only one Hour, twenty seven Minutes, forty Seconds.

§ 14

The *Cycle of the Moon* is nineteen *Julian* Years; in which Time the New Moons come to

to have nearly the same Place in the *Julian* Year as before. § 13.

§ 15

The *Julian Period* is a Cycle of seven thousand nine hundred and eighty *Julian* Years; *viz.* =28×19×15; and is the least Dividend measur'd by the three Cycles (§ 10, 11, 14). It begins when the Cycles all began together; (*viz.* seven hundred and sixty four Years before the Creation of the World) and ends when they all end together. The three Cycles begin *Jan.* 1. according to the *Latins*; tho' the *Greeks* begin them at different Times of the Year.

This Period was by *Scaliger* first apply'd to Chronology, and admir'd by all, as a Period that has no Ambiguity. The first Year of the Epocha of *Christ* (according to the common Account) was the 4714th of the *Julian* Period: And A. D. 1582 was the 6295th of the same.

§ 16

To find the Year of the Cycle of the Moon Sun and Indiction in any Year of our Lord.

When 1, 9, 3, *to the Year hath added been*
Divide by 19, 28, 15;

and the Remainders are the Numbers sought. V. g. To find what Year of Indiction falls upon A. D. 1719; divide 1719+3 (i. e. 1722) by 15; the Remainder 12 is the Number sought.

But

But if the Queſtion be, what Years of any of theſe Cycles fall upon ſuch a Year of the *Julian* Period? There's no Addition. § 15.

§ 17

To know what Day of the Week the firſt Day of *March* is in any *Julian* Year for ever; find what Year of the Sun's Cycle it is: §. 16. (N.B. 1701 is the ſecond Year of the Cycle) Then take this Canon,

Youth ſtudy Zealouſly; Look wond'ring round
How quick Jove throws away cæleſtial Bowls;
Now greatly onward mov'd: Vaſt Effort: Famous King.
Xenophon's Doctrine prize; Διος γνωςιαν άμα Βιλης.

Explication.

Here the twenty eight Years of the Cycle are ſignify'd by the twenty four Letters of the *Engliſh* Alphabet and the firſt four of the *Greek*, beginning each Word in the Canon: The Days of the Week are ſignify'd by the laſt Vowels in thoſe Words, *viz.* the ſeven Vowels, *a*, *e*, *i*, *o*, *u*, *y*, *w*. E. g. A. D. 1719 (the 20th of the Cycle) is ſignify'd by *V* (the 20th Letter in the Alphabet (in the Word *Vaſt*; where the laſt Vowel being *a* ſhews the firſt of *March* is *Sunday*. So 1725 (the 26th of the Cycle) is denoted by β in Βιλης; whoſe laſt Vowel *e* ſhews the firſt of *March* is *Monday*.

3 ¶

§ 18

To find what Day of the Week the firſt

Day

Day of any Month in any *Julian* Year i
on; find what Day of the Week is the
Day of *March* preceding the Month in (
stion: § 17. Then take this Canon,

March April May June July August
A Dreadful Fire, Beholders daily gaze,
September, October, Novem. Decem. January, Febr
Chastised England, Ah! cruel fatal Blaz

E. g. In A. D. 1725 the first of *March* is
day; then as F (the first Letter in the
fatal, which stands for *January*) is the 6
the Alphabet, so the first of *January*
1726 is *Saturday*, or the 6th of the Week
Monday inclusive.

§ 19

To find the Dominical Letter or Lette
any Year; find what Day of the Week i
first of *January*; § 18. and the Domi
Letter of *January* and *February* is know
8, 9. Then find which Day of the Wee
first of *March* following is § 17; and if
the same as the first of *February* before
common Year, and the same Dominica
ter serves for all the Year: If differen
Leap-Year, and has two Dominical Lett
9. If the Year propos'd be any Year o
Lord you have a Compendium. § 4.

§ 20.

Having the Years of the three Cycles
to find the Year of the *Julian* Period yo
instructed *Lowth*. Philos. Trans. Vol. III.

II. Cap.2. N° 1. p. 399. But the Demonſtration depends on a tedious Calculation and various Trials, the Problem being imperfect.

Without that Method, if you have any Gueſs, take any Year of the Period near the Matter: Find the Solar Cycle of that Year: § 16. Go forward or backward till you come to the Year whoſe Solar Cycle is the Number given: Then add or ſubſtract 28, till you find the Year on which the given Numbers of the other 2 Cycles fall.

§ 21

Chronologers alſo make uſe of *Civil Lunar Years* in Eccleſiaſtical Computation; deſigning to make each ſuch Year and each Civil Lunar Month, as near as may be, begin with a New Moon: (viz. not the real Conjunction, but the firſt Illumination; which in *Paleſtine*, about the Time of the vernal Æquinox, was about 27 Hours after the Conjunction: For the *Jews* and others, and probably the *Nicene Fathers* call'd this the New Moon.) Which Years are thus fram'd;

They make a Civil Year of 12 Months, having 29 and 30 Days interchangeably; only in every 4th or Leap-Year 7 of the Months have 30 Days and 5 have 29. So that the mean Lunar Year is 354 Days, 6 Hours, wanting almoſt 3 Hours of the Truth; (§ 12) which being ſubſtracted from the mean *Julian* leaves 11 Days.

§ 22

§ 22

Such a Year the *Turks* and *Arabians* use; which has this Inconvenience, that the Seasons in less than 40 Years run thro' all Parts of their Year. *Prideaux* Life of *Mahomet*, p. 87,—89.

§ 23

To prevent this, and also to correct the 3 Hours Error, (§ 21) when the Beginning of the Lunar Year is thirty Days or more behind the Beginning of the *Julian*, Chronologers insert betwixt the Lunar Years an *Embolismal Month* of thirty Days: (which embolismal Month, being bigger than the Synodical, compensates the three Hours Defect,) For every mean civil Lunar Year wanting eleven Days of the *Julian*, nineteen such Years want two hundred and nine Days of nineteen *Julian*. Now seven Embolismal Months of thirty Days intercalated every Cycle (§ 14) are two hundred and ten Days; and therefore one Day is cut off from the End of the nineteenth civil Lunar Year. So that these nineteen Lunar Years and seven Months are just equal to nineteen *Julian*; and exceed two hundred and thirty five Synodical Months only by one Hour, twenty seven Minutes, forty Seconds; (§ 13) a small Error, not perceiv'd or not regarded by the Ancients.

4¶

§ 24

The Lunar Years, by these Intercalations thus accommodated to the *Julian*, are call'd *Luna-Solar*: And much such Kind of Years the *Athenians* and *Jews* us'd.

Prideaux Connect. Par. I. Lib. VI. p. 392.—395. 8°.

§ 25

The *Epact* of any *Julian* Year is the Number of Days Distance betwixt the last New Moon of Illumination and the Beginning of the *Julian* Year: And to the Epact of any Year adding eleven (§ 21) and substracting thirty, if the Sum be as big as thirty, the Remainder is the Epact of the next: But to the Epact of the last Year of the Cycle add twelve, to find the Epact of the first Year of the next Cycle, still casting out thirty if you can. § 23.

§ 26

To find the Epact in our Age (viz. from A. D. 1582 to 1894) multiply the Golden Number of the Year given (i. e. the Number of the Moon's Cycle) into eleven, divide the Product by thirty, and the Remainder is the Epact of the Year. E. g. The Epact of the first Year of the Cycle is 11; of the second 22; of the third 3; of the last 29: Whereas in the Time of the *Council of Nice* they stood thus 7, 18, 29, &c. viz. four must be substracted from

your

your formention'd Product before you div
to find the Epacts of the *Nicene* Age. For
Cyclic Defect of one Hour, twenty seven
nutes, forty Seconds (§ 23) amounts to a
in about three hundred and twelve Years.

Thus the Epact in any Age may be fou
For as many of such Cycles of 312 as
Age propos'd is sooner or later than 1582
many Days must be subtracted from or a
to the present Epact to find the Epacts of
Age.

§ 27

To find nearly the Moon's Age, (begin
from its Illumination not its Conjunct
on any Day of any Month, and where
new Moon of Illumination falls in
Month:

To the Epact of the Year (§ 26) add
Number of the Months from *March inclu*
(for in each Month except *February* the Lu
Civil Month (§ 21) loses a Day of the *Ju*
Month) and the Day of the Month propo
from which Sum subtract thirty of you c
the Remainder is the Age of the Moon on
Day propos'd: And the Complement of
Remainder (no Day propos'd having been
ded) to thirty is the Day of the Month
which the New Moon of Illumination f
But in *January* and *March* add nothing to
Epact; (for *January* and *February* are equa
two Civil Lunar Months) and in *February*

two to the Epact (for so many Days has the Moon lost since the Beginning of *January*) *e. g.* In 1719 the Golden Number (§ 16) is ten, the Epact (§ 26) twenty. In *February* then 20+2 being substracted from 30, shews the New Moon of Illumination is on the 8th of *February*.

§ 28

The Ancients suppos'd the Epacts would hold the same for every Age; and accordingly the *Church of England* Calendar computes the New Moons of Illumination on this Supposition, taking the Epacts as they were at the Time of the Council of *Nice*: And for each Year of the Cycle of the Moon finding on what Days the New Moon of Illumination would fall each Month, § 27; they set the respective Prime or Golden Number against that Day of each Month. To find then the New Moon of Illumination of each Month in any Year by that Calendar; find the Prime of that Year, § 16: Seek it in the first Column of the Month given, and the Day it stands over against is the Day sought. E. g. In *February* 1718, the 9th Year of the Cycle, the New Moon of Illumination is the 23d Day.

The New Moon thus found is called the *Ecclesiastical New Moon*, to distinguish it from the real New Moon of Illumination, which in

our Age is every where 4 Days ſooner: V. g. on the 19th of *February*.

§ 29

The Full Moon falls in the fourteenth Day incluſive from the New Moon of Illumination, or, which is all one, on the 15th incluſive from the Conjunction. The Eccleſiaſtical Full Moon therefore is on the 14th incluſive from the Day the Prime ſtands againſt.

§ 30

By no Cycles can the New Moon be found exactly, by reaſon of the Inequality of the Synodical Months; much leſs by a perpetual Table of Epacts ſuited to the DecennovalCycle, they not being the ſame in all Ages: (§ 26) But they muſt be computed by Tables founded on Obſervation.

§ 31

The Lunæſolar Year was introduced among *Chriſtians*, that they might keep *Eaſter* next *Sunday* after the *Jews* Paſſover. (§ 24) Now the Paſchal Lamb being killed the fourteenth of *Niſan*, which was the firſt Month of the Year, and began as near the Vernal Equinox as the Form of their Year would allow; (§ 23) the Council of *Nice* ordained that *Eaſter ſhould be kept on the next* Sunday *after the fourteenth Day of the Moon incluſive, which fourteenth*

teenth Day should come upon or next after the Day of the Vernal Equinox; but if the fourteenth was a *Sunday*, *Easter* was the *Sunday* after; that *Easter* might not coincide with but follow the Day of the *Jewish* Paschal Lamb. The Vernal Equinox they suppos'd would always be on the 21st of *March*, (§ 5, 6) as it was then, *viz.* *A. D.* 325, and the Epact always the same: § 28.

With this Canon agrees the Rubrick of the *Church of England*; substituting *the Full Moon (i e.* the Ecclesiastical, § 28) instead of *the fourteenth of the Moon* (§ 29) and *the twenty first of March* instead of *the Vernal Equinox*. The soonest therefore that *Easter* can fall O. S. is *March* 22; and the latest *April* 25.

Lowthorp's Philos. Trans. Vol. III. Par. II. Cap. II. N° 3. p. 403.

Prideaux Connect. Par. II. Preface, p. xii-xv.

6¶

§ 32

Having the Year of any Epocha given, 'tis possible to find the Equinoxes, New Moons, and Eclipses of that Year.

Find what Year of the Julian Period it is, (as Chronologers will inform) Find the Equinoxes by § 6, 15: Find the Golden Number, § 16; and thence the New Moon § 27; or more exactly by § 30. Find the Eclipses by

Astronomical

Aſtronomical Tables; or more groſly by the *Saris*, or Table of eighteen Years ten Months and eighteen Years eleven Months interchangeably (*Aſtron.* § 16) in which Time the Eclipſes with ſome Variation revolve.

And *vice verſa* from the Equinox given we find what Year it is of the great Cycle of 47482 ½ Years (*viz.* 365 ¼ × 130. § 6) in which the Equinox revolves in the *Julian* Year; which will be as well for Uſe as finding the very Year.

From the New Moon given according to the Epact, we may find the Golden Number: From the New Moon exactly given the very Year, by Aſtronomical Tables, inaſmuch as the Lunations return not exactly to the ſame Parts of the *Julian* Year in any reaſonable Time.

From the Time of the Eclipſe given we learn the Year of the Saris: From the Eclipſe exactly given as to Time, Bigneſs, Place, *&c.* the very Year by Aſtronomical Calculation.

§ 33

Pope *Gregory* the thirteenth *Anno Domini* one thouſand five hundred and eighty two obſerving the Præceſſion of the Equinox in the *Julian* Year from *March* the twenty firſt, as it was at the Council of *Nice* (§ 6) unto the eleventh; and alſo the Cyclic Defect, by reaſon of which the *Nicene* Epacts and the

Primes

Primes in the Calendar gave the New Moons four Days too late; (§ 28) he very nearly remedy'd these things, by castigating the *Julian* Year and reducing it to what we call the *Gregorian* or New Style, as follows:

After *Anno Domini* one thousand six hundred of every four Years terminating four Centuries, the three first are common Years of three hundred and sixty five Days, the fourth (*viz. Anno Domini* two thousand) a Bissextile; whereas in the Old Style they are all four Bissextiles: (§ 6.) and also at the End of three hundred and twelve Years there is a Day left out of the Lunæsolar Year, or, which is all one, the Epacts are increas'd by one; (§ 26) and the *Nicene* Epacts in Ecclesiastical Computation rejected.

§ 34

In the Year one thousand five hundred and eighty two, when this Reformation was done, there were ten Days left out of the Year, that the Equinox might again be on the twenty first of *March*.

§ 35

The Dominical Letters in the New Style are found by different Tables in different Centuries.

§ 36

Having the real *Julian* Epact of any Year before one thousand seven hundred given (§ 26) take from it 10 Days (*viz.* the Difference of the

Be-

Beginning of the *Julian* and *Gregorian* Year) and after one thousand seven hundred 11 Days, after one thousand eight hundred 12 Days, &c. and you'll have the *Gregorian* Epact: V. g. the *Gregorian* Epact of one thousand seven hundred and nineteen is 9, of one thousand seven hundred and twenty 20, &c.

§ 37

In the New Style from the Epact is found the New Moon of Illumination by § 27: And *Easter* observed strictly according to the Canon of the Council of *Nice*; (§ 31) neglecting the Calendar that we use in the *Church of England*.

§ 38

The Old Style is us'd by all *Astronomers* and *Chronologers*, even by way of Anticipation in treating of Times before *Julius Cæsar* as well as after.

Prid. Connect. Par. II. Book IV. p. 230--247.
Strauchius's Chronology *passim*.
Keill's Astronomy at the End.

FINIS.